WE MAGAZINE WHICH INTEGRATES MATERIAL HANDLING EQUIPMENT INTO THE FLOW OF PRODUCTA

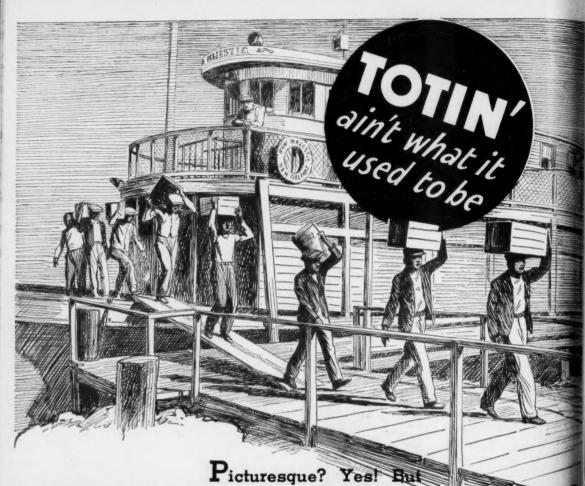
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THIS ISSUE: Handling and Merchandising...In Fine Shape...Handy Handling



in your business there's no pay-off on the glamour of brawny back and sweating torso . . . Better be practical and have your totin' done the modern way —with a time-and-effort-saving TRUCK-MAN.



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IN THE BARGAIN!"

Yes, many a plant owner has saved himself the cost of a new warehouse because he let an A.T.C. material handling Specialist make a survey of his material handling costs.

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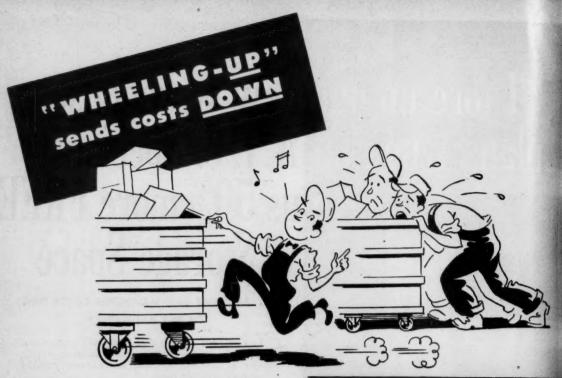
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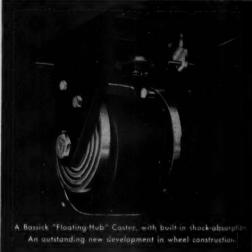
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MAY, 1946



Forward-looking executives know that quicker, smoother movement in the handling of materials saves time, labor and operating expenses. And they make sure of these important savings by investing in *better* wheels and casters—that roll easier, last longer and protect floor surfaces.

Is your own portable equipment "wheeled-up" to meet modern standards of efficiency and economy? Check with Bassick — world's foremost producers and developers of wheels, wheel-mountings and casters. At your request a Bassick factory representative will be glad to call, and to make constructive suggestions for improved, cost-cutting mobility. Write to THE BASSICK COMPANY, Bridgeport 2, Conn. Division of Stewart-Warner Corporation. Canadian Division: Stewart-Warner-Alemite Corporation, Ltd., Belleville, Ont.



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S. A VETERAN EASTON TIER-LIFT ELECTRIC TRUCK







WITH STEEL WHEELS 8, EASTON LOW-LIFT TRUCK PUSHING PLATFORM CAR 9, TWO EASTON 40-TON DOUBLE-TRUCK PLATFORM CAR







16. EASTON LOW-LIFT ELECTRIC PLATFORM TRUCK 11. EASTON 5-TON PLATFORM CAR, TIMKEN BEARINGS 12. EASTON OPEN FRAME TRAILER, 5000 LBS. CAPACITY



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ALL of these EASTON-engineered electric lift trucks, industrial cars and trailers are serving one manufacturing plant. The complexity of light and heavy, routine and highly specialized handling and production operations helps to illustrate the scope of EASTON's integrated engineering service. Plant managers and engineers who are faced with a similar variety of flow and handling problems find it

convenient and helpful to refer their questions to Engineering Counsel, Easton Car & Construction Co., Easton, Pa.

ENGINEERED

A-1009

MAY, 1946





Here's an example of how a well-known gas company takes advantage of the pre-engineered versatility of Barber-Greene Portable Belt Conveyors. Several of these simple units are skillfully used to move coal from large-area stock piles to every loading station. Portable, they are easily adapted to changing conditions with a minimum of time and effort.

Literally, this is a "rapid change" conveying system. Conveyors may be quickly added or removed to meet different requirements-and aligned to carry materials around corners and to every part of the storage area.

The simplicity and usefulness of Barber-Greene Portable Belt Conveyors are features you should investigate if any of your problems involve the movement of bulk materials. Shortened or lengthened by the addition or removal of sections, B-G Portable Belt Conveyors often eliminate the need for costlier permanent installations. To learn about them see your Barber-Greene representative. Barber-Greene Company, Aurora, Illinois.













PORTABLE CONVEYORS

FLOW

# MERCURY

# Materials Handling Equipment

Mercury, a pioneer in the materials handling field and the originator of "The Trackless Train" System (tractors and trailers) has over 35 years experience designing, manufacturing and installing handling equipment. This experience is your guarantee of high efficiency and dependability in all Mercury lift trucks, tractors and trailers.



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Mercury Elevating Platform Trucks are available in the following models:

"Junior" Models: Low and high lift types. 4000 lbs. capacity. Compactly designed for work in confined areas.

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"Tug" Electric Tractor: A powerful compact tractor available in "twin-wheel," and "4-wheel" models, medium or heavy duty.

"Banty" Gas Tractor: The most compact tractor made, yet develops a draw bar pull in excess of 2000 lbs. Thousands now in use.

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For detailed information on Mercury tractors, trailers, and lift trucks, request Bulletin 201-6.

THE MERCURY MANUFACTURING CO. 4154 S. HALSTED ST. CHICAGO 9:11L.



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THIS 100 foot Roebling "Flatweave" Sling will carry a 72,000 lb. load with a safety factor of 6.

Think what this can mean to you in reducing handling costs! And there is a "Flatweave" sling for every type and weight of load, from a few pounds to many tons.

The high efficiency of Roebling "Flatweave" Slings is the result of a unique method of construction. The body of the sling is made of six separate ropes consisting of two pairs of two ropes each laid in opposite directions and joined by two single tie ropes. With this patented type of construction there is no

possibility of shearing or scissoring action between any of the ropes while they are under load.

A seventh rope is woven into the wearing part of the loop to provide added wear resistance and permit use of the sling without thimbles. All rope ends are fastened by compact steel sleeves which form a permanent joint requiring no servings, splices or tucks. This elimination of fittings permits the utilization of the entire sling weight for lifting capacity. The Roebling "Flatweave" Sling is safe, efficient, flexible and easily adapted to a wide variety of load lifting uses.



# ROEBLING

PACEMAKER IN WIRE PRODUCT

# VALUABLE FREE AIDS TO SELECTION AND USE OF CORRECT SIZE AND DESIGN OF SLINGS

The new Roebling Sling Data Book A899 contains a wealth of material on wire rope slings. It offers complete data on 3 principal types, classes of loads, proper design for required safety factor, and suggestions for getting maximum service from your slings. Full details on sling sizes, fittings and instructions for ordering.

This Sling Data Book can help every man in your plant who is responsible for moving or loading materials.

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A handy Sling Calculator is yours for the asking. It enables you to determine quickly and surely the safe working load for your Roebling Slings on every class of lift. May be used for wire rope or "Flatweave" slings. The durable surface has full printed instructions for use as well as handy tables and diagrams which will help you get the most from your slings.

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Roebling standard slings are available for general use, although many Roebling slings are designed to handle specific loads. Whether you require a standard or a special sling, your inquiry and order will receive the careful attention of Roebling engineers.

#### JOHN A ROEBLING'S SONS COMPANY

TRENTON 2. NEW JERSEY

Branches and Warehouses in Principal Cities

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Company.

MAY, 1946



THIS 100 foot Roebling "Flatweave" Sling will carry a 72,000 lb. load with a safety factor of 6.

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# RACK CONVEYORS saved 1235 man-hours per month! per month!

...and paid for themselves in 60 DAVS

Typical of many RACK installations throughout industry

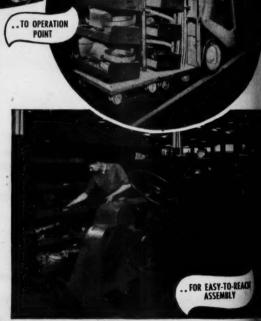
# PLACEMENT helps speed Assembly and Machining

.. TO PORTABLE

THE movement of sets of related parts, step by step, from stock room to point of final assembly, by Rack Conveyors, is shown in these pictures. Note that the material is sorted and placed on Rack Conveyors in workable order, creating a portable bank for servicing operation points.

Thus controlled materials placement avoids loss of time and confusion and helps speed production!

Write for information on Rack Conveyors for your particular shop procedure, whether for handling, moving or processing.



Over 300 Leading Manufacturers Use

GONVEYOR SYSTEMS

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 See how easy it is to locate parts and how accessible they are to operator... nothing on the floor, everything within reach, no duplicate handling!

6 of the 18 Rack Units Available

REPRESENTATIVES IN PRINCIPAL CITIES

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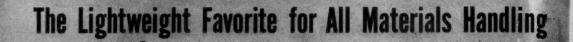
Why aren't we using we hathanode tatteries? MATERIALS HANDLING SUPERVISOR Glass Mat Design? Gould Kathanode power was a startling innovation when introduced to American industry in 1925. Since then the demonstrated superiority of glass mats has resulted in wide-spread use of this form of positive plate protection. During its 21 years of experience, research and field testing Gould has added many improvements to the original Kathanode design. Incorporated in the now famous Kathanode Unit, and still exclusively Gould, are a specially designed grid, long lasting Black Oxide active material, mats of layered spun-glass, and the Unit-Seal envelop that minimizes short circuits and internal power losses. Gould research is constant, so look to Gould for leadership in battery developments. Write Dept. 105 for Catalog 100 on Gould Kathanode Glassklad Batteries for Industrial Truck and Tractor Service.

MAY, 1946

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THOUSANDS of busy plant men in almost every industry have proved the superiority of Union Metal's broad line of materials handling equipment. They found from hard-job experience that these rugged steel skids, boxes and pallets...

# · CUT COSTS

# · SPEED PRODUCTION

# . SAVE TIME

because they're engineered for the job.

Union Metal's materials handling units are precision planned by top-flight materials handling engineers to do a better job. They're light in weight—easy to handle—able to withstand hard knocks. They help you keep floor space clear for production—handle raw materials or finished production efficient unit loads.

Stock items to meet standard requirementsspecial designs for your special needs. For conplete information and able engineering assistants, write The Union Metal Mfg. Co., Canton 5, Ohio.

# UNION METAL

Materials Handling Equipment

# Automatic System



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DELIVERS CORE SAND
TO 9 STATIONS

FROM a simple push button control, operator of speedmuller keeps nine core makers supplied with fresh core sand at all times.

This system operates as follows — Self-dumping bucket is lowered to floor at speedmuller to receive core sand. Operator raises bucket with twin hook hoist, sets the station selector and then presses starter button. The unit runs to the proper station and stops — bucket makes complete revolution dumping sand in hopper — whereupon the unit returns to loading station. All this operation occurs automatically, with no further attention from operator.

This is just another of the many automatic systems designed by American MonoRail Engineers using the American MonoTractor. Let us tell you more about this rubber wheel drive unit. An engineer will consult with you without obligation.

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LOW MAY, 1946

ing of sand at core bench

# MODERN HANDLING METHODS



There's no time to lose in getting operating costs on a competitive unit-cost basis. Modern methods of handling are now a must. Electric industrial trucks, for example! Palletized loads! And, of course, the newest development in motive power Storage Batteries . . . the sensational Philco "Thirty" that gives 30% longer life! Try Philco "Thirty" in your hardestworking trucks. The tougher the job the better it shows up. Write for the facts today.

• The new Philco "Thirty" Industrial Truck Storage Battery, that gives 30% longer life, is identified by its distinctive red connectors.

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Famous for Quality
the World Over

PHILCO CORPORATION - STORAGE BATTERY DIVISION - TRENTON 7, NEW JERSE



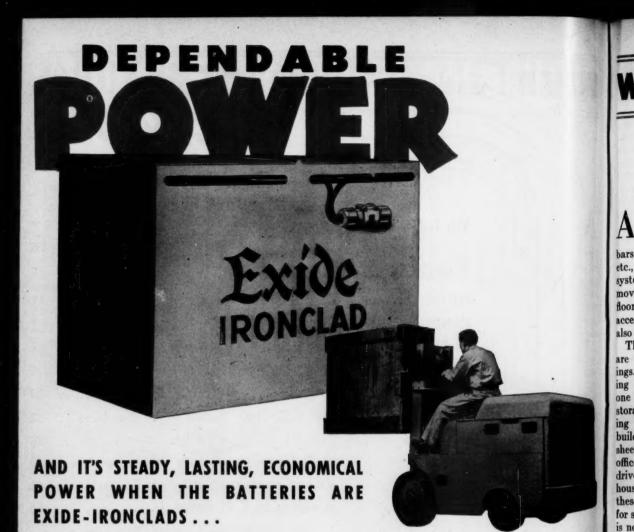
The magazine which integrates material handling equipment into the flow of production.

Vol. 1, No. 8 MAY 1946 In this issue WHERE You Want It . . . WHEN You Want It-structural steel . . . 15 HANDLING and MERCHANDISING-modern methods aid packaging 17 IN FINE SHAPE—a Ward Baking Co. operation..... 23 NO LIFT, NO LAG, NO EFFORT—streamlined assembly for batteries 26 STUDY of the UNIT LOAD SYSTEM—at The Singer Mfg. Co. . . . . . 30 "WELL BLENDED" HANDLING—How Maxwell House does it..... 32 BOUND to Get There—steel strapping of car lots of drums..... 38 HANDY HANDLING NO. 2—interesting manually operated devices... 40 SPEED is of the ESSENCE—an excellent job at Railway Express..... 58 On the Pallet-news, views, trends... 36 New Literature-free material from Small Plant, Shop Installations-ce-Opportunities: Men and jobs wanted, New Products—equipment of interest 52 EDITORIAL DEPARTMENT FLOW EDITORIAL AND BUSINESS OFFICES-1240 Ontario Street, Cleveland 13, Ohio CURTIS H. BARKER, JR., Consulting Editor NEW YORK OFFICE-CHESTER RICE MANFRED SCHUELER, Editor 60 E. 42nd Street, Room 950 New York 17, New York, Murray Hill 2-0488 HUGH GRABLE, Managing Editor CHICAGO OFFICE-NORMAN J. LOTT PRODUCTION DEPARTMENT 64 E. Lake Street, Room 1110 Chicago 1, Illinois, Andover 4972 WM, V. LINAS, Director LOS ANGELES OFFICE-ROBERT H. DEIBLER CIRCULATION DEPARTMENT 403 West 8th Street Los Angeles 14, California, Tucker 1579 E. J. HEXTER, Director

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COVER PHOTO—Scene at the Cleveland plant of the Ward Baking Co. After cooling, bread is discharged on this spiral chute, which delivers the loaves to the two belt lines shown in the center of the photo. The bread circulates on these two connected lines until fed into the automatic slicing machines. See article beginning on page 22.



More and more, management executives are finding that Electric Industrial Trucks, powered by Exide-Ironclads, are the right answer to their materials handling problem. Numerous records prove that this efficient combination assures more tons per man per hour . . . and at lower cost, which means greater profits.

Exide-Ironclad Batteries deliver continuous service day in and day out for years. They have the bigh power ability required for frequent "stop and go" service . . . the high maintained voltage that constant lifting, hauling and stacking demands . . . and the high capacity needed to assure steady, day-long performance with full shift availability.

Write us for a FREE copy of Exide-Ironclad Topics which contains "Case Studies" of materials handling problems. It tells how to cut handling costs up to 50% . . . covers latest developments in handling materials from receiving to shipping.

Materials Handling offers one of the greatest opportunities for reducing costs and increasing profits, that are available to Management today.

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Inherently dependable Built for long, hard service Provide maximum safety. . best working conditions Fast handling and accurate spotting Effective use of lowest cost power Lowest overall cost

> HIGHEST EARNINGS GREATEST SAVINGS

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toron

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# WHERE you want it WHEN you want it

#### By CLEM DOBLER

Plant Manager Builders Structural Steel Co. Cleveland, Ohio

A THE Builders Structural Steel Co., Cleveland, about 2000 tons of plates, sheets, bars, structurals, reinforcing bars, etc., are handled each week by a system that coordinates overhead movement by cranes with on-the-floor transfer by cable car. Certain accessories of special interest are also described in this article.

The facilities of our company are housed in six different buildings. The main plant (four adjoining buildings constructed under one roof) contains fabrication and storage departments. In the following description, each of the four buildings is referred to as a bay. A sheet steel warehouse, adjoining an office building, is located across a driveway. Three additional warehouses are across the street from these buildings. (A seventh one, for special manufacturing purposes, is not concerned in this article.)

#### Cranes and Cable Cars

Material comes into the main plant in freight cars or highway trucks. A siding located at the north end of this building is long enough so that five 45-foot cars can be unloaded at the same time. The crane runways extend from inside the building over the truck platform at the south end, and over the freight car platform at the north end. This allows for overhead handling of material from unloading to storage and from storage to cutting and fabricating, then to shipping.

When material is moved from bay to bay, as during fabricating operations, it is handled on the electric cable car. This is an endless cable type with a reversible motor, and runs on a track about 200 feet long. A controlling lever is located on the floor near the start





S-type hooks secure the bridle chain as the crane lifts a bundle of reinforcing bars.



A 20-foot spreader beam combined with hooks is used to lift long lengths of steel plates.



Here is the crane with two hooks for different capacities mounted from the same trolley.

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of the run. The tracks also connect the main building with the plate warehouse across the driveway, thus facilitating transfers between the two buildings. The flat top car is seven feet long and four feet



Cable car is coordinated with overhead crane in moving the material through fabrication.

wide. It is constructed of 8-inch standard I-beam framework with four cross beams and four 6-inch Hbeams bolted to the top.

Here is how the steel is handled in each of the four bays. Since different types of materials go through the same type of operations in each bay, the handling is somewhat similar. The entire main building is built on a slope. Thus the overhead at the north end of each bay is around 50 feet which is reduced to 20 feet at the south end. This problem is overcome by using S-type hooks in conjunction with the chain slings of the overhead cranes. This permits the loads to be carried at any desired height, since the hooks fit through any link in the bridle chain and back through the main ring. The hooks are constructed of 5/8-inch, 40carbon steel plate.

#### Reinforcing Bar Department

A 5-ton, cab-controlled overhead travelling crane services the entire reinforcing bar department located in Bay No. 1, which measures 294' x 45'. The bars usually come from the mill in 60-foot lengths. After they are removed from the freight cars by crane, they are stored horizontally in the adjacent area. Dunnage separates the lifts which are limited in weight by the capacity of the crane.

From storage the material is moved a short distance to the next operation where it is cut, bent and shaped according to the specifications of a particular order. Upon completion, the bars are stored according to order number in the nearby finished goods area. When a load is ready for shipment, a highway truck backs onto a scale at the north end of the bay and is loaded by means of the crane. Material shipped by freight car is carried by crane back to the north end of the bay and loaded directly into the cars.

# Use of Spreader Beams

Bars and steel plates are handled in the second bay which measures 294' x 37'. This area is serviced by a 10-ton overhead crane. Bars are handled by the same chain and S-type hook arrangement as previously described. Plain hooks are used for lifting the smaller lengths of plate. They are combined with spreader beams when handling the longer lengths. Construction details on these hooks and spreader

## Mechanically Speaking

The hooks for handling plates, designed and manufactured by the company, are made up of 11/2-inch steel stock bent into a V-shape, with hooks on each end of the V. The spreader beams, also constructed in the plant, consist of two 20-foot long channel irons bolted back to back with plate stiffeners top and bottom. Five chains, of 9/16inch stock, hanging from the beam make it possible to pick up plate steel 40 feet long. The plating hooks fit through 6-inch rings at the end of each chain and grip the material.

beams are given in the "Mechanically Speaking" section of this article.

Angle iron is handled in the third bay. Here two overhead cranes travel on the same runway and service the area. One crane operating on the north side has a 7-1/2-ton capacity. The other has two hooks mounted on the same trolley. One hook can lift up to 20-ton loads, while the other has a 5-ton capacity. Each hook is operated by a separate motor. Since the one

with the smaller capacity can be operated at a greater rate of speed this arrangement permits quich handling of light loads with the flexible equipment.

Angle irons go through the same unloading and storage operations From storage, they are moved to the shearing machine for cutting Lifts of 60-foot lengths are lowered by crane onto a long skid. From here they are pushed individually onto a set of rollers, spaced four feet apart, which feed the machine The shear is on the same level as the skid and rollers, so that the pieces can easily be moved into machine. After being cut to the desired length, the angle irons are moved by crane to the finished goods area and stored according to order number to await shipment.

## Handling Beams and Channels

The fourth bay in the building houses the beams and channels. It measures 294' x 77'. Lifts of this type of material are stored on skids and cut when necessary by torch. Two cranes also handle the loads in this department, one of 10-ton capacity and the other 7-1/2-ton. Loaded trucks are weighed, as in Bay No. 1, on a scale located in the southwest corner of the building.

RTISER

Fabricating operations take place in the north end of the main building. The material is laid out and marked in the fourth bay and then placed on the cable car for movement to the punching, riveting, fitting, welding, and painting stations which are located in the adjoining bay. The car moves the loads from operation to operation and the crane lifts them whe necessary.

# Overhead Handling in Other Buildings

All of the space in the other to buildings, used for warehousing, covered by overhead travellicanes or hoists. Material mome into these buildings on his way trucks since the only side servicing the plant is located alors ide the main building. One exciton is the sheet warehouse which connected by cable car track with the main building. When is practical, loads of sheet steel to the sheet warehouse which connected by cable car track with the main building.

(Turn to page 51)

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1240 Ontario Street Cleveland 13, Ohio

By A. DOUGLAS MURPHY

Manufacturing Department
Standard Oil Company of New Jersey

The Standard Oil Company of New Jersey finds that mechanized handling of oil drums not only reduces costs, but also aids in the delivery of an attractive package to the customer. A system several miles long does the job.

FOR many years oil companies have handled and moved drums by rolling them, that is, when they were not conveyed on their bilges, or sides. The cylindrical shape of this container seemed its own best transporting medium. The idea belongs to the era before the importance of modern material handling was recognized, and this is not too many years ago.

There are a number of reasons why drums shouldn't travel on their sides. In a reconditioning and

# HANDLING AND MERCHANDISING



Vertical conveyor delivers drums in a vertical position to main line in the cleaning department.

filling operation, such as the one described in this article, a drum that is being rolled must be returned to a vertical position a number of times. Each change of position means a handling—and that costs time and money. And, after the drum is painted and branded, rolling it on the floor mars its attractive appearance. That amounts to undoing part of the effect of a painting job that also costs money and effort. Too, with manual handling considerably fewer units per

manhour can be produced than when drums are kept moving over a continuous conveyor system, standing upright from beginning to end of the operation.

Material handling engineers tell us that the Standard Oil Company of New Jersey was among the first concerns in this field to take advantage of the savings—in time and effort—that are obtainable through mechanized material handling. An up-to-date system for handling empty and full drums has been in-

Soiled drums are processed in these automatic cleaning booths at both sides of 2nd floor main line.



From main live roller conveyor, drums can be deflected to reversible powered line in foreground.



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stalled in the lubricating oil drum filling plant at Bayonne, N. J. This system was designed both to reduce handling cost and time as well as to deliver a better-looking package to the customer. In other words, modern handling is a definite aid to our improved packaging program, launched some months ago, whose purpose is to enhance the sales appeal of 55-gal. drums and smaller units. Thus, in our operation modern handling and merchandising are closely linked. At this writing, the

The slat conveyor on the receiving dock feeds the barrels through a wall opening to a vertical conveyor which connects the three floors of the drum storage and reconditioning building. By throwing a switch, the vertical conveyor can be set so that the drums will be discharged automatically on the second or third floor, or from the third to the second or first floor, depending on the need.

In this way new packages are automatically delivered to the new

Care has been taken to facilitate access to either part of the floor which is divided by the main conveyor line in his room. At various points crosswalks with hand rails have been constructed. And, as a protection for operators, guard rails have been attached to both sides.

Another feature might be mentioned. The whole system, vertical as well as horizontal, is controlled by a series of limit switches. If drums should not be taken away at a point where jams or damage is



In branding department, each set of two gravity roller conveyor lines is separated by a walkway.



From beginning to end, barrels move in upright position. Filling room in Bayonne will be like this.

mechanized installation in the Bayonne plant is being extended beyond the branding department to the filling, warehousing and shipping operations. Mechanized handling systems are also being installed in our other plants.

Handling the Empties

The empty drums, both new and used, arrive by freight car and highway truck. As they are unloaded they are placed on a slat conveyor which runs the length of the receiving platform. This conveyor crosses a roadway between two buildings, and hence the line has been equipped with a lifting section. Its use will permit the roadway to be opened in case of emergency. (Arriving drums were previously rolled across this space on gravity skids.)

Thus, beginning at the receiving point, the drums travel on their ends or chimes, and no labor is necessary to return them from a horizontal position back to a vertical position. (The only exception, described later, is necessitated by the spraying operation, and the turning over in this case is performed mechanically.) The avoidance of turning the drums is an important factor in view of the many thousands of units that are handled weekly.

drum storage area on the second floor, where the powered main roller conveyor line runs the full length of the room. Of course, the barrels are discharged in an upright position. Lateral lines branch off from the main line to the left and right and extend the full length of each bay. Switches are set at any point where it is desired to deflect the line of traveling drums.

The lateral conveyors, also powered, are reversible, and thus the packages can be returned to the main line whenever empties are to be drawn from this location. Drums being moved out of this area may be fed to another vertical conveyor installed on the opposite end of this 161-ft.-long room. This second vertical conveyor is frequently used for delivering the units to the branding department on the second floor or to the truck shipping platform on the ground level.

I would like to point out a feature of this "live" storage method. The arriving drums virtually store themselves, and stand ready for use on the roller conveyor lines. When needed, they do not have to be picked up or otherwise handled. A switch is thrown—that's all—and a given line starts moving the units. likely to result, the limit switches are brought into play and shut off the system.

#### Handling Soiled Drums

The used and soiled empties are likewise delivered by one of the two vertical conveyors to the proper floor (from the freight car platform on one end or from the truck platform on the other end of the building). These units are routed to the cleaning department on the third floor. The packages are here likewise discharged in vertical position on the main line that divides the floor space.

After a short travel, they are drained over troughs which are arranged parallel to the conveyor. Immediately beyond this point the conveyor inclines toward the cleaning unit—a series of booths built on an elevated platform and arranged on both sides of the line. This station is shown in one of the photos.

After the barrels have been thoroughly cleaned, they are inspected by means of a specially designed fluorescent lamp which is attached to the end of a rod. The lamp is inserted into the bung, giving the operator a clear view of the interior.

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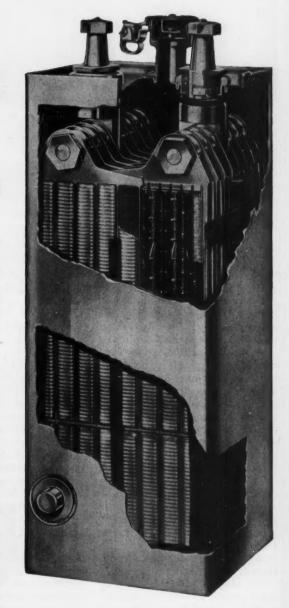
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give most trouble-free
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# ...ALKALINE BATTERIES have the most durable construction

ALL KINDS of material handling operations are being performed by battery industrial trucks with a remarkable record of day-in-and-day-out dependability, freedom from rouble and overall efficiency. In factories, warehouses, railroad shops and docks... wherever materials must be moved... they are staying on the job with an amazing regularity that surpasses even the highest expectations of users.

An important reason for their high availability for service is their comparatively simple operating mechanism. The electric drives in a battery truck have the minimum of moving parts to require attention and replacements, and are free from wear-and-tear vibration. Thus a battery truck is rarely out of service for repairs. Exchange batteries keep the truck continuously supplied with power. So except for the few minutes to change batteries two or three times per 24-hour period, the truck need not stop working for servicing its power unit. It is also economical to operate. Not only does it use power most efficiently but the current used for battery charging is the lowest-cost power available. The truck starts instantly, accelerates rapidly yet consumes no power during stops.

Altogether, the battery truck is a most dependable and economical material handling unit ... especially when powered by Edison Alkaline Batteries. With steel-cell construction, and a fool-proof electrochemical principle of operation, they are the longest-lived, most durable and most trouble-free of all industrial truck batteries. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Co., Ltd., Montreal and Toronto.





XUM

The inspected packages are returned to the main line and, as in the case of the new drums on the used by the branders and inspectors as they perform their duties. This room is divided into two main



Layout sketch shows vertical conveyors and arrangement in second coat department.

floor below, are then deflected for storage into the bays arranged to the left and right. Or the drums may be routed directly, via the other vertical conveyor at the opposite end of the room, to the spraying operation on the floor below.

Along the many thousands of feet of travel, the spray booths are the only point at which the drums are turned over. As indicated previously, this is done mechanically and is an entirely automatic operation. A few feet before the units enter the booth a down-ender places the drums in a horizontal position. The packages are revolved rapidly as the paint is sprayed on in the booth. (Three colors can be sprayed at one time.) From the booth the drums are conveyed through a baking tunnel, built over the line. At the end of the tunnel an up-ender returns the emerging units to a vertical position, and a few feet farther on they are discharged on a live roller conveyor. As in the other departments previously mentioned, numerous branch lines extend from the main line into the bays, serving as a temporary storage area before the packages are routed over the system to the meter filling operation.

The room in which the spraying takes place is also the branding department. The drums are spraybranded as they stand on the lateral gravity roller lines. As can be seen from the diagram, the storage conveyor sections are arranged in pairs, with a walkway between each set of two. These walkways are

sections, with each section of lateral conveyors flanked by a live feed roller conveyor line on one side, and a live discharge conveyor on the other side.

An idea of the size of the system can be gained from the following figures. This room contains 4800 feet of gravity roller and 750 feet of live roller conveyor. The footage in the other departments is comparable, the total adding up to several miles of conveyor line.

#### System Being Extended

As previously stated, the system is at present being extended beyond this point. The whole installation should be completed within the next few months. The live roller discharge lines in the branding room will deliver the packages via spiral conveyors to powered roller lines in the filling room on the floor below.

From here the packages will again be deflected onto transverse gravity roller sections built parallel to the meter filling stations. When completed, this part of the system will comprise 1500 feet of gravity and 800 feet of powered conveyor line. While the photo of this operation shown on these pages is from one of our other plants, it illustrates practically the same method and equipment that will be in use shortly in our Bayonne plant.

After filling, the units, still traveling upright, will be moved to the main line which will deliver them to the adjoining full-package storage area. In this department, according to plans drawn up some time ago,

five main lines of live roller c nveyor will deliver the filled packages to the numerous lateral lines extending into the bays. This part of the installation will consist of 2,800 feet of powered and 11,500 feet of gravity conveyor.

Finally, a powered line will move the packages from here to the platform for loading on trucks and into freight cars. From this main line the drums of oil—their bright coats of paint unsoiled and intact—will be deflected directly into the outbound carriers. Another powered line will go out on the pier for delivery of the packages by water carrier.

## Several Distinct Advantages

Thus the miles-long system effectively coordinates a number of departments located on several floors. In several instances it gives us the equivalent of a continuousprocess operation, the system feeding the various operations in a continuous stream, and moving the drums away with a conspicuous absence of confusion or stoppages. The need for manual handling has been eliminated, likewise the former "turning over". An idea of the extra time and effort this extra handling required can be gleaned from the fact that previously the drums were turned over an average of six to seven times in moving through this operation. The system has also enabled us to provide a better sequence of operations by arranging the functions along the line of travel in their proper order.

While a tally of over-all results awaits completion of the system, a marked increase in units per manhour has been noted in the departments affected. And, the drums travel upright on their ends, assuring the delivery of a distinctive and attractive-looking package to the customer.

"Happy motoring."

# FLOW for June

Heavy-duty work is simplified by means of proper devices in a metal fabricating plant so that it can be performed with ease by women. . . Routing many types and sizes of pieces through enameling operations . . . How a printer handles a heavy tonnage of paper and ink. These are a few among other practical case-studies now in preparation for the June issue.

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If you "give a hoot" about LOWER PRODUCTION COSTS you'll "BE WISE AND TURNERIZE"

THE TURNER SYSTEM OF MATERIALS HANDLING

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Handling!" Here one man does the work of several and keeps materials properly stored in bins at the same time. Loads are moved with the hand "Jimmy," power lift truck, crane, or tractor.



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# Modern, Mechanized Devices IN FINE

This plant of the Ward Baking Co., one of the most highly mechanized bakeries in the country, produces two to three million lbs. of bread and rolls a month.

By EARL V. WOLFE Manager, Ward Baking Co. Cleveland Bakery

THE product in our plant moves by gravity and a variety of mechanical devices, and handling operations are designed to produce an appetizing loaf of bread. The avoidance of crushing or squeezing the baked loaf is a major objective. How this is done can be observed from the moment the panned dough enters the conveyorized oven until it is loaded into trucks for delivery to thousands of grocery stores and restaurants.

The plant contains five stories and a basement. A siding for freight cars is located to the east of the

building on the second-floor level. A sheltered U-shaped truck platform, long enough to accommodate from 90 to 100 trucks, is located at the north, east and west sides of the ground floor. While cakes as well as rolls are produced, the specific subject of this article is the white bread department.

## To Storage and Mixing

Flour arrives by freight car in bags containing from 100 to 140 pounds each. The cars are spotted alongside one of three chutes which lead from the platform to the basement. At the bottom of the long chute, the momentum carries the bags to the end of a 25-ft.-long extension or table. From this, the bags are loaded on skids, 21 bags to a skid. The loads are moved by powered hand lift truck to the storage space assigned every carload. Since the skid loads stand about seven feet high and come within a few feet of the low ceiling. tiering is not possible.

Each bag is tagged according to gross and net weight of the contents. Small blackboards in the area list the amounts stored in each section and the date of entry. Firstin, first-out inventory control is used, and as the flour is moved into process the quantities on the boards are changed accordingly.

When needed for processing, the skidded loads are transferred by powered hand truck on the "flour elevator" for movement to the fifth floor. This elevator is one of five in the building, each assigned to a specific department or function.

On the fifth floor, the loads are



Skid load containing 21 bags of flour is moved on powered hand truck to assigned storage space.





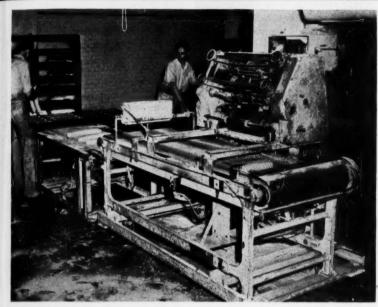
Section of overhead track is elevated to dump sponge from trough into machine.

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# deliver our daily bread SHAPE



Rolling begins under the wire mesh, right. The dough then passes between the two belts to panning station.

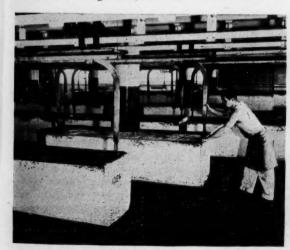
removed by powered hand truck and placed in temporary storage in the blending room. The loads are then spotted near the blending bins, where the sacks are emptied. From the blending bins the flour is transferred by screw conveyor to an enclosed storage tank, and from

here through a wall opening into the next room, where it is fed to a sifting machine. The sifted flour is then carried by another screw conveyor through a long trough equipped with five discharge spouts that lead to the mixing machines on the floor below.

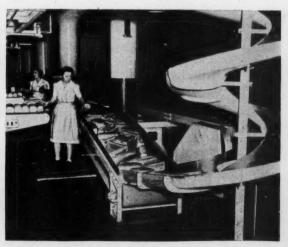
This part of the system, from blending bins to the mixing machines, is equipped with numerous inspection plates. This enables us to empty and thoroughly clean every part of the installation at regular intervals.

Rye, cracked and whole wheat flour (a relatively small part of the total volume) are sifted through separate equipment. This material is brought to the sifting operation from a room which has a lower floor level. A ramp eliminator, especially designed for the company, has overcome the problem of transferring the loads from one floor level to the other. The skidded loads are elevated by the ramp eliminator from the lower to the higher floor. Before the installation of this hydraulically operated ramp eliminator, shown in one of the photos, it was necessary to reload the skids between the two floors.

Ingredients (other than flour and water) that go into the two mixings of the dough, such as shortening, malt, yeast, sugar, salt and others, are measured in aluminum pails in the scaling depart-



Loaded troughs are pushed onto branch lines of overhead track to Finished loaves circulate on the belt lines until fed by the operators



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This ramp eliminator saves rehandling of bags. hopper from the fifth floor, while the other material is moved into the department by elevator.

#### Dough Moves by Monorail and Chute

In the bread mixing machines more than a half ton of ingredients are handled at a time. After the mixing, the sponge (bakery terminology for the first mixed product of flour, water, yeast and malt) is discharged by the revolving blades into an empty trough. approximately 10 feet long, four feet wide and three feet deep. This trough rides on an overhead monorail track. The loaded troughs are pushed into branch lines in the adjacent storage area, where the mixture is allowed to ferment. After it has risen sufficiently, the sponge is returned to the mixing machine. The sections of the overhead track alongside each machine are elevated electrically, and the troughs are raised to a sufficient height so that the sponge can be discharged (via a sliding door on the bottom of the trough) for the remixing. The resulting finished dough, replaced in the trough, is then moved to the opposite end of the room, where it is discharged through a chute installed above the dividing machines on the third floor. The sliding door is opened on the bottom of the trough and the mass slides out.

The dividing machines on the third floor cut the dough into pieces of the desired weight (either for the 12 or 14-inch loaf), and the individual pieces then travel over short belt lines, via the rounder, to the dry proofer. The latter is a long conveyor, whose

carrying surface consists of "cups", six to a row, and the amount in each cup is the quantity required for one loaf. As the dough travels slowly in these cups across the room, it recovers from the mechanical beating it received in the operations just mentioned.

At the end point, the material is discharged onto a belt conveyor, which delivers it to the molding machine. The dough emerges from the molder in the form of flat pieces, which must be rolled before they can be placed into the pans.

The flat pieces are ejected onto a belt line, on which a mat of wire mesh, about 12 inches long, is installed at a predetermined point. As the soft mass passes under the wire mesh, the front edge of the dough is caught by the mat, and the forward movement of the belt rolls it into the desired shape. The rolled dough then passes freely under the rest of the mat, placed loosely on the line. This is an ingeniously simple method for rolling the dough. The operation is then completed between two belt lines, shown in one of the photos.

The rolled pieces are thus carried to the panning station, where they are placed in pans, four pans to a unit. (The smaller pans used for the 12-inch loaves are loaded on a slat conveyor which delivers them to the steam box, then to the oven entrance where they are automatically fed.)

The pans containing the 14-inch loaves are too large for this conveyor. They are placed on shelf trucks, pushed in and out of the steam box, and fed by hand into the conveyorized oven.

## A Fresh Loaf of Bread

The pans are carried on a continuous metal conveyor at a slow pace through the 100-ft.-long oven, whose carrying surface is solidly covered. The conveyor is wide enough to accommodate 16 pans. Thus many hundreds of loaves are constantly being baked. About 30 minutes are required for a pan to pass through the oven. At the discharge end, the pans are inverted by operators and thus, without being touched, the fresh bread is passed through a chute onto the shelves of the cooling conveyor. This circulates in a housing installed near the ceiling on the floor

below. The empty pans are stacked on four-wheel hand trucks for return to the "panning-up" station.

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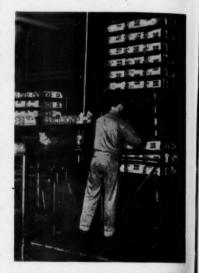
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The carrying surface of the cooling conveyor consists of tilting shelves, spaced about one foot apart and each holding 16 loaves This conveyor doubles back near to the starting point before discharging the product, thus giving the bread ample time to cool. (A cooling unit in the housing is available for use when required by the room temperature.) The loaves are discharged onto a spiral gravity chute which delivers them for temporary storage to an ovalshaped conveyor line. This consists of two parallel belt lines connected at each end by 180-degree stainless metal sections. Parallel to one side



The air operated leveling platform enables operator to slide loaves into the tierable trays.

of this line is a battery of slicing machines. The bread keeps circulating on the belt lines until fed into the slicing machines.

From the latter, the sliced loaves travel over powered belts to the automatic wrapping machines. Bar deflectors change the position of the bread as necessary, thus again avoiding the need for manual handling and so avoiding the possibility of crushing it. The wrapped product is discharged to a double-deck belt conveyor. A divider is installed on each carrying surface, and a series of switches permits the product to be routed to either side of the belts. This "main line" dips through a floor opening and delivers the bread to the first-floor shipping area.

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The handling of the product at the end point on this floor is likewise interesting—it again illustrates the "do not crush" principle. The loaves are discharged on a stainless metal table, alongside which a dolly with 13 tierable basket-type trays has been spotted. These trays are elevated on an airoperated leveling platform, in such a position that the bottom tray is on a level with the table at the beginning of the operation. This positioning requires the arriving

loaves neither to be gripped nor lifted by the operator. He merely slides the loaves over the smooth metal table into the trays. When a tray is loaded, the operator pushes a button, which lowers the tiered receptacles for loading the next tray. When the last tray (on top) is even with the table, the tiered trays have reached the floor level. The loaded rack is wheeled to the order assembly area, and the next set of empty trays is then elevated into position.

The bread, which retains its rounded form throughout the many

steps, is now arranged according to size and kind. Order pickers assemble the salesmen's orders from this stock and wheel the trays into the locations assigned each route. The salesmen roll the tiered receptacles to the nearby loading platform. Again, in loading the trucks, the loaves are handled in the trays. This makes it unnecessary to "manhandle" the product at the point where it leaves the plant, assuring that the loaves will be delivered in "fine shape" to the ultimate consumer.

# MODERN FOUNDRY HANDLING PRACTICES

THE Ferro Foundry & Machine Co., Cleveland, has several lines set up to produce castings for the automotive industry on a mass production basis.

Roller, belt and slat conveyors move flasks, molds, patterns and cores, while several overhead chain conveyors make transfers of castings between departments and buildings.

One of the most interesting operations in the plant is the handling of heavy castings after the shake-out. The photo below shows castings being removed from the shake-out machines and placed according to size and form in basket-type



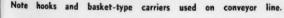
This is the cooling conveyor for castings.

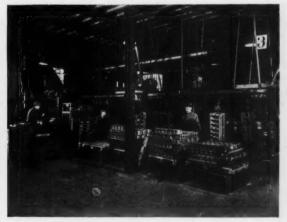
Here the material is cooled for five hours as the conveyor curves back and forth at different levels. The to the carriers or to the hooks and transported to the next operation.

At the heat treating station, the units are removed to oven trucks. Tractors are used for moving the trucks in and out of the oven. After this operation is completed, the castings are again placed on the conveyor and transported to the next station. Some of the different types of carriers are shown in the photos. The one on the left is an open metal tray on which the castings (heads for motor blocks) stand on end. The tray has loops at the top which drop down over the ends of the heads and hold them in place.

In the third photo, the same overhead conveyor brings the finished pieces into the shipping de-







on conveyor line. At end point, palletized loads are spotted on skids for easy loading.

carriers, or hung individually on hooks suspended from the overhead chain conveyor. Beneath the loaded carriers are troughs to catch any falling metal. The conveyor moves the castings across a ramp to a cooling shed outside the building. castings are then carried into another building where machining, grinding and chipping operations are performed. All of these work stations are along the path of the conveyor. After each job is performed, the castings are returned partment. It passes along a line set up to remove the castings to pallets. Skids are used here to hold the pallets at a convenient height for loading. When the loads are complete, fork lift trucks move them to shipping or storage. Batteries move in this Willard plant from assembly through shipping without once being lifted. Horizontal and vertical conveyors, powered trucks and special skids provide the CAREFUL handling this product requires.

OU may not realize it, but the battery that starts your car is made according to the same progressive assembly methods as the automobile itself. Through scores of operations-from raw to finished product—the battery is moved by a system several thousand feet long, without being lifted once the whole time! This is a remarkable feature when you realize that the products being manufactured at the Cleveland plant of the Willard Storage Battery Co. from five ounces to more than 500 pounds each.

While numerous types of batteries are made for a large variety of purposes, the present description covers the handling of "starting and lighting" batteries used for passenger automobiles. Care is essential, since the product must not be handled roughly lest it be damaged. Hence all conveying devices and methods are designed to provide this care through every step in the manufacturing process.

# Receiving and Distribution Line

The containers, or battery boxes, arrive by freight car and truck.

ISTRIBUTION ROTECTION

RODUCT



Operators paint emblems as boxes move on line. The trays holding paint can be slid as needed

Portable sections of gravity roller conveyor are extended into the cars, and the containers thus move to the powered belt line running on the unloading dock. Trucks are unloaded in a similar manner. The containers are delivered through a wall opening to the main receiving line in the storage area. As the containers enter the building, they pass a 20,000-volt testing station, where any defective units are eliminated. A control button is located at this point to regulate the flow of containers should any rechecking be necessary. After testing, the containers pass a paint station,



Battery containers are fed to bucket conveyors over four sections of Skid load of plates being delivered by platform truck to the splitting three-lane gravity lines.



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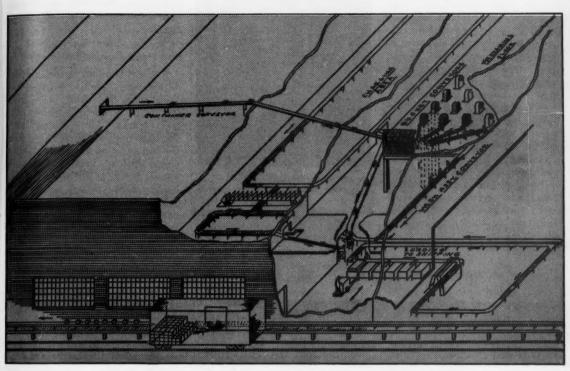
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FRAGILE PRODUCT THROUGHOUT



Flow sheet shows delivery of battery cases from receiving through assembly and shipping.

where an operator on each side of the line stencils the lettering using a hand roller. (Usually the boxes travel two rows abreast on this line.) Note that the containers are tested and painted as they travel toward their destination.

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By means of hinged gates and portable gravity roller sections, the arriving boxes may be routed to any desired location in the storage area, and may thus also be returned from any stockpile to the main line when needed. Or, after inspection and painting, they may be sent directly to the mezzanine section located above the assembly stations.

#### Two Focal Points

This mezzanine section is one of two focal points for the supply of the various parts which make up the battery. The company has developed this elevated "feed-in" position in order to use a minimum of the vital assembly space on the main floor.

From the mezzanine floor, containers, covers, top connectors, straps and separators are fed down to the ground floor assembly line by means of vertically driven bucket-type conveyors. The containers are loaded onto the conveyor buckets from four radially positioned gravity lines (the end points of the main receiving conveyor). Covers, separators, and the other component parts are likewise placed on the buckets (actually trays with backs welded to them to retain the contents), and the conveyors circle the items constantly over the assembly line below. Each conveyor is so located as to furnish a constant supply of parts to the assembly operators, and the speed permits easy removal of the required parts from the buckets.

The other focal point is located on the ground floor, where the plates are fed to the line. Since this material is relatively heavy, and is consumed in fairly large quantities, it is moved by skid and powered platform trucks directly from fabrication to this initial assembly station. The skid loads of plates are first positioned alongside splitting machines. They are fabricated in twos, hence a splitting operation must be performed before they enter the line. This is done on several special high-speed splitting machines which separate the two halves, and clean the plate lugs prior to welding.

An interesting feature of this particular layout is the chip conveyor which is embedded in the floor directly below these machines. As each small strip of lead drops, it is carried away by a power driven conveyor, and is dumped into a container which is later removed by a powered lift truck to the smelter.

As the plates are ejected from the splitting machine, they are stacked

MAY, 1946

on skids which are moved to the assembly line. The plates are now ready to be assembled into groups. The operator places them into specially designed jigs which are mounted on a chain drive ovalshaped conveyor. These in turn pass through an ingenious burning machine which welds them. They are then fed into the main assembly line. The conveyor used here consists of mesh sections mounted on continuously moving drive chains. The containers pass from station to station in an uninterrupted flow while the component parts are being added.

When this part of the assembly is completed, the parts must be sealed in place. The compound used for sealing is piped from an overhead reservoir to the assembly line, where operators tap electrically heated and thermostatically controlled lines as needed. Since this compound is thick, the use of natural gravity also aids in maintaining the desired pressure.

## Lifting and Jarring Avoided

After sealing and testing, the assembled battery is fed to a belt conveyor which carries it to the second floor, where the formation charge is imparted. The batteries are slid from this conveyor onto tables where they remain temporarily to receive this charge.

At the required time, they are returned to a line which delivers them to a room directly below for another charge. Before the batteries are sent down, they must first be emptied of their fluid contents. A specially designed conveyor is employed for this purpose. This consists of angle iron retainers mounted to a horizontal, chain

driven conveyor. The retainers are adjustable to hold batteries of various widths. As the batteries are



Operator loading separators on bucket conveyor which delivers them to the assembly.

held securely, they can be passed through an upright-inverted-upright cycle without danger. Again, all movements of loading and unloading are performed by sliding the battery to and from the conveyor. The batteries return via a powered belt line (powered to maintain even flow and careful handling) to the charging operation on the floor below. Again, there is no lifting done and thus jarring is avoided. Operators slide the batteries to their charging tables and then move them back in the same way when this operation is completed.

Each battery (without being removed from a continuous slat conveyor) is then checked thoroughly. If any defects are present, the battery is removed from the conveyor for proper adjustments. The other units pass to the painting station.

The exterior lacquering of the battery container is done by spraying, with the spray booths being located diagonally across from each other. Operators are stationed at opposite sides of the line, each lacquering one part of the battery. Infra-red units are used to dry the cases. The batteries emerge and now travel toward the end point of the line.

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#### Five-Sided Cartons Protect Product

Efficient handling in the shipping department avoids bottlenecks. Waist-high live skids are placed parallel to the line by powered platform trucks. An operator slides the batteries onto these skids from the conveyor. A lift truck then removes the loads to stock, the motor vehicle platform or to the railroad loading dock.

Here is the type of protective packing used before the batteries are placed in the outbound vehicles. A five-sided carton (without a bottom) is slipped over each battery. Thus the smooth bottom of the battery container remains uncovered and so can be slid with ease into position over the plank used for loading.

But the terminals at the top must also be protected against crushing weight when the layers are built one on the other. The packing also provides for this. A flat corrugated cardboard band, about two inches wide, is first inserted flush against the top inside the carton. The latter is high enough to cover the sides of the battery while allowing for the two-inch "free space" created by the corrugated insert at the top. Thus the carton actually rests on the battery by means of the corrugated support.

Operator removing top connectors from bucket of conveyor, which delivers them from floor above.



Loading finished batteries on live skid to be removed by platform truck to loading docks.



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tery on top when the next layer is built. Thus the five-sided carton serves a twofold purpose: (a) Being without a bottom, it permits easy loading by means of sliding. (b) And by use of the corrugated support inserted against its top, it effectively prevents the batteries in the upper layer from resting directly on top of the batteries in

And because of the snug fit of the

carton, the support in turn rests

only on the outer edges of the bat-

tery. In this way a two-inch "cush-

ion" is provided over the top of

each packaged battery, and the cor-

rugated support is strong enough

to "hold off" the weight of the bat-

# Safety First

the lower layer.

Whenever lead is used in manufacturing, it is important to eliminate any hazards which might be present to affect the workers' health. Nearly all of these hazards have been removed from the Willard plant operations. Throughout the maze of aisles and areas devoted to the manufacture of storage batteries, grated metal flooring has been installed under which flows a constantly moving stream of water. Any minute lead dust particles are therefore disposed of immediately and are later collected and reclaimed.

In that part of the battery assembly line where lead is handled, the carrying surfaces of the various conveyors are likewise grated. Small particles of lead dropping off fall through the grating, to be later removed. All workers on this line wear gloves to protect their hands.

Where there is any possibility of dangerous concentrations of dust, three safety precautions are used. First, rules provide that each worker must wear a respirator; second, the floors are wet down constantly to prevent dispersion of dust particles; and third, extensive exhaust systems have been in-

## FRANK S. LAMPARD

The Mathews Conveyor Co. announces the sudden death of Frank S. Lampard, on April 17. He was long associated with Mathews and considered an expert in the application of hydraulics. Lampard was 47 years old when he succumbed to a heart attack.

SAVE MAN POWER - CUT COSTS - SPEED DELIVERY

# Warehousing & Distribution of Loose or Packaged Products









# PORTABLE CONVEYORS



Farquhar Portable Featherweight Conveyors handle bags, boxes, cases, cartons, crates, hampers, etc., with speed, economy and trouble-free daily performance. Featherweights are right for every shipping and warehousing need . . . carry in either direction, have the flexibility of mounting shown in the models at right. They'll handle items weighing up to 125 lbs. and 24 inches or more in width at a rate of 25 per minute. Farguhar builds Portables for every loading, unloading and materials handling problem . . . for any kinds of loose or packaged goods.

> Write or wire Farguhar Portable Machinery Division today.



Flexibility of mountings to fit your requirements is shown in sketches.

It Pays to Convey the Farquhar Way



PORTABLE OR PERMANENT MATERIAL HANDLING CONVEYORS FOR COAL · COKE · SAND · GRAVEL · BAGS · BOXES · CRATES · CARTONS · BARRELS · ETC.

PORTABLE MACHINERY DIVISION

NINETIETH ANNIVERSARY YEAR A. B. FARQUHAR COMPANY 206 DUKE ST., YORK, PA.

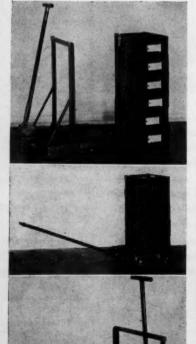
MAY, 1946

# Study of the Unit Load System

The Singer Manufacturing Company has pioneered in advanced handling methods since 1912. An outstanding feature is the use of units interchangeable with hand-lift, platform-lift and fork-lift trucks.



Photo above shows load of stock-box skid racks in course of interdepartmental haul.



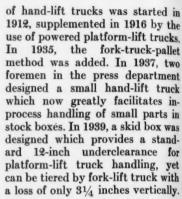
PART 1.

POR the production of some 1,500 varieties of sewing machines and the servicing of machines in the hands of users, The Singer Manufacturing Company produces and stocks more than 100,000 different parts in its mains plant in Elizabethport, N. J., alone.

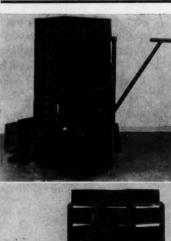
The company's handling operations are correspondingly complex; but many years ago the management recognized the importance of efficient handling and has been a pioneer in developing and applying improved methods.

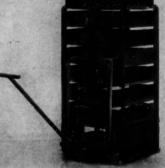
Unit handling on skids by means

Courtesy, Storage Battery Power, December, 1945

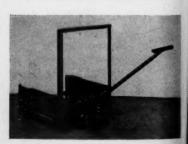


Today, as a result of these and other original developments, the company has a handling system which is flexible enough to cope with the wide variety in sizes, kinds, and quantities of material to be handled and, at the same time, is simple enough to do the work with





A special hand-lift truck makes easy work of in-process handling of standard stock boxes. Photos on this page show construction and method of picking up the boxes by handles, two photos upper, left. The same truck is also adapted to skid loads of 12-inch underclearance, lower left and below. The versatile truck then handles either piles of boxes, top, center column, or stock-box skid racks, as shown in lower photo, center. Three Singer factories use about 180,000 stock boxes for handling and stocking small parts.



# at The SINGER MANUFACTURING CO.

relatively few standardized types of handling units, all of which, with comparatively few exceptions, are interchangeable with hand-lift trucks (for in-process handling), powered platform-lift trucks (for interdepartmental transit), or fork-lift trucks (for storage and carloading).

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### Notable Stock-Box System

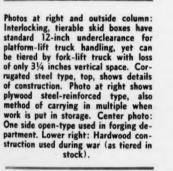
The unit used in largest quantities is a stock-box having measurements 20 by 12 by 6 inches, some 90 per cent of which are of steel and the remainder of plywood construction, steel-reinforced. As its name implies, it is used as a container for parts in process as well as for storing finished parts in the stock rooms, in which case the boxes constitute drawers which fit into stationary 10-high stock-box racks and thus are an integral part of the company's system of parts cabinets. This stock-box is standard in three Singer factories.

In-process handling of these stock-boxes may be done manually one at a time. Or, by means of a special type of hand-lift truck developed originally by two press-department foremen, the boxes may be handled in piles of two or more, or in stock-box skid-racks which hold 14 boxes. When handling the boxes in piles, the truck engages the handles of the lowest box. When handling the boxes in skid-racks, the truck is provided with buffer plates which adapt it to the standard 12-inch under-clearance of the skid-rack. The buffer plates are detachable and do not interfere with the engagement of the box handles, so that they may be omitted if the truck is to be used only for pile handling, or they are added if the truck is to be used for handling both stock-box piles and stock-box skid-racks.

In a similar manner, motorized pallet hand-lift trucks have been adapted to handling either pallet or skid loads. An angle-iron frame, designed and built in company shops, increases the height of the lift for handling skids and is easily swung out of the way for handling pallets.

The primary purpose of the stock-box skid-rack, however, is to facilitate interdepartmental han-

(Turn to page 50)





Motorized hand truck, shown below, was originally designed for pallet handling, but also was adapted for skid handling by means of welded angle iron frame. It is readily lowered or swung out of the way vertically for pallet handling.







# "WELL BLENDED"

Unloading green coffee, right, at the Maxwell House pier (warehouse at right), where bags are palletized.

View from warehouse toward lighter, below, with fork truck at right of photo.



A N outstanding example of a coffee roasting plant is the Maxwell House Division of the General Foods Corporation in Hoboken, N. J. Here thousands of tons are handled annually—without being touched by hand. This modern, daylight plant, situated on the Hudson River, has sufficient capacity to produce the "makings" for 30,000,000 cups of coffee daily. Its six floors comprise 500,000 square feet.

### Mechanical Devices Mix the Blend

The bags of coffee are received in lighters at the company's 600-ft.-long concrete pier. The bags are usually unloaded by boom and winch, six bags to a draft. A lighter's load may comprise up to 5,000 bags of green coffee. The individual

bags contain either 132 or 154 pounds, depending on whether the product comes from Brazil or Columbia.

The drafts are deposited on a platform, alongside which the product is palletized. The loads are moved by high-lift fork trucks to the storage area which is immediately adjacent, being the covered portion of the long pier. The raw material is stacked to a height of about 18 feet, leaving only inches of space between the top layer and the rafters.

The individual pallet loads average approximately two tons, and the pallet size is  $5\frac{1}{2}' \times 5\frac{1}{2}'$ , designed especially for the size of bags handled. Usually 30 of the lighter (Brazilian) bags are placed on one pallet, and 24 of the Colombian bags. The company regularly maintains a stock of about 5,000 tons of green coffee in its warehouse.

When needed for production, the pallet loads are spotted beside the blending stations, located on the pier level which is the basement of the building. Six blending stations are arranged in parallel, and each station has its own system throughout the plant—that is, its own cleaners, mixers, roasters, grinders, etc. Thus the No. 3 blending station, for example, feeds No. 3 line throughout the system. This arrangement provides strict control over the quality and uniformity of the individual batches (2,600 pounds) being processed.

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The coffee dumped into the chute at each blending station is fed into a pit by screw conveyor, and from here it is carried by bucket elevator to the sixth (top) floor. The product is here discharged into bins above the cleaners. Foreign particles such as pieces of wood or string are removed, and an air system collects and carries away the dust. Additional cleaning devices, installed along the route of travel, will be noted in subsequent paragraphs.

### Preparing the Brew

The cleaned coffee beans drop from the cleaner into the bin above

# IANDLING

The coffee packer's two primary considerations are proper blending, and getting the product FRESH to the consumer's table. Maxwell House uses pallets, fork trucks, and a variety of gravity, air-operated and mechanical conveying systems.

the horizontal mixer. This is an oblong drum whose mixing action assures that the several kinds of beans which are made up into a batch are uniformly blended. The mixed green coffee is then delivered by a gravity chute into a storage bin and from here to the boot of a bucket elevator on the third floor.

The elevator takes the raw material to batch bins installed on the fifth floor above individual roasters, which process 1500 lbs. of green coffee at one time. During the roasting process the chaff, the thin light skin of the coffee bean, is released by the bin. The chaff is carried away with the hot air going through the roasters and is finally deposited in a dust collector on the roaster air discharge line. The collected chaff is then conveyed by an air system to the chaff burners on the roof.

After roasting, the coffee, now a rich brown color, is discharged into a cooling car, an enclosed circular pan, in which the product is moved by revolving rakes towards a discharge spout; the latter delivers the product to the stoner bin on the fourth floor. From the stoner bin the coffee is discharged to the stoner. The stoner is an air separator, so arranged and regulated that the air stream picks up only the roasted coffee beans and leaves behind the pebbles or pieces of metal that may have been with the roasted beans. This stoning process serves as a safeguard for the grinders.

The product thus returns to the fifth floor—to the roasted coffee storage bins—from where it flows by gravity to the grinders on the fourth floor. Here another precaution is to be noted. The coffee beans pass through a magnetic field, which removes bits of nails, etc., before dropping into the chute that feeds the grinders.

On leaving this operation, the ground product drops on a vibrating screen (a final trap), which discharges into a screw conveyor leading to specially designed bins, called "true-flow." These are storage bins that are mechanically agitated and tapped on the outside, thus keeping the fine and coarse particles evenly distributed within. The bins, of course, also provide the necessary storage between the grinding and filling operations. From this point the coffee flows by gravity to the filling machines located on the second floor. At individual stations in this department the product is packed in glass jars, cans and paper sacks.

### "One Pound of Coffee, Please"

The subsequent description deals chiefly with the handling and movement of the glass jars at the packing station, though features of the can packing operation will be indicated in passing. The "glass" feeding station is on the third floor, above the packing station. Palletized loads of cases of glass jars are spotted for the convenience of the operators. They remove the jars from the cases and place the individual containers on a conveyor line leading to the filling machine on the second floor. The empty cartons, incidentally, are placed in chutes and are thus delivered to the case packers (to receive the finished product) on the floor be-

The jars (as well as cans and bags) are fed automatically to

Blending drum, center, right, one of several used. It mixes various kinds of beans put in each batch of coffee.

Empty jars, right, going to second-floor filling station. Empty carton, center of photo, is on way to case packers.



From the lighter, this high-lift fork truck takes over, tiering two-ton loads 18 feet high





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the high-speed filling machines. The opening of the loaded "bucket" (a cylinder holding the weighed



Full cans travel to vacuum-sealing machines. Arrow points to clever empty-can detector.

amount) is synchronized with the movement of the revolving table under the scale, so that one pound of coffee is dropped in the right place at the right instant. The coffee is dropped into a metal funnel above the jar. The latter is shaken mechanically as the coffee drops in, thus settling the coffee properly for the subsequent vacuumizing and sealing operations. This high-speed machine fills 120 jars a minute.

From the filling machine, the conveyor line branches out into two separate lines. This is because the two vacuum closing machines, next in line, operate at the rate of 60 jars a minute. After labeling and packing, the full cases move via a chute to the overhead conveyor line in the first-floor shipping room.

Can Packing: While the glass jars are fed by gravity to the filling machine, the cans arrive by overhead conveyor line from the adjacent factory of the American Can Co. With minor exceptions, the filling of these units proceeds much in the same manner as in the case of the jars. A noteworthy feature here is the empty can detector.

This is an aluminum wheel rotating on a horizontal axis, and the latter is capable of a vertical motion of 1½". This wheel revolves over the full cans as they move by on the line. The resistance of the coffee keeps the vertical motion within a predetermined limit. If no coffee is present in a

can, however, the greater vertical motion would actuate a control which stops the vacuum machine.

After packing and sealing, these cases are likewise delivered to an overhead powered roller conveyor in the shipping department on the first floor.

### Power Handling for Quick Delivery

Here, the several overhead conveyor lines merge at a central switching station, from which a single gravity roller line declines to the floor and forms the take-off station. At points along this line the cases are palletized (according to brand and grind), as shown in one of the photos.

The pallets are not placed directly on the floor, it should be noted. Instead, they are spotted on sections of gravity rollers installed at right angles to the take-off line. A completed pallet load is pushed to the end of the transverse section, thus immediately providing a free area for the next empty pallet. There are four such conveyor sections, each of which can accommodate four pallets. This means that 16 pallets can be prepared without any dependence on the fork truck operator to remove each individual load as it'is completed. Thus the stackers are not kept waiting, and the fork truck is free to serve other operations in the meantime.

The palletized loads are moved from the adjacent warehouse area to the nearby freight car or truck

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Fork truck spots two palletized loads at one time on flat trucks positioned on car dock.

loading platforms. The plant has two loading platforms with a capacity for 13 cars.

The size of the pallet used for the cases is 31" x 52". Since the length of the truck forks is 54", the truck can haul two of the fairly narrow pallets at one time. For car loading purposes, two fourwheel hand trucks are arranged alongside each other near the car door. As the fork truck deposits its double load, one pallet load is automatically spotted on each flat truck. The loading gang consists of four men, two of whom are assigned to each hand truck. The pallet-bearing trucks are then wheeled into the car, and the load-

Palletized loads are moved away from take-off line, foreground, on lateral conveyor sections.



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Five fork trucks of two-ton capacity serve this floor at all



Two operators then wheel each truck into the car, and load both ends at the same time. times. They also handle many tons of incoming material, which is palletized at the receiving point. Several motorized pallet hand lift trucks are used for serving loads of case goods to outbound motor trucks.

These are the highlights of how the Hoboken Maxwell House plant serves millions of Americans a fresh cup of coffee daily. The various mechanical handling devices that are integrated into the excellent product flow contribute their share to the over-all operation. And it is designed to make the product "Good to the last drop."

### FOR EASY POSITIONING

AN ASSEMBLY OPERATION that requires extreme accuracy is performed here by means of a pendant-controlled hoist on a traveling beam. The photo shows a main cam shaft being inserted into the gear box of a



multi-spindle bar machine. The long and heavy piece is inched into position and can be moved up and down or swung sideways as necessary. Subassemblies weighing up to a ton are handled in this way at The National Acme Co., Cleveland.

MAY, 1946



Cases, kegs and packages can't walk and you're wasting time, labor and money if you lug them about by hand. A Rapids-Standard Wheel-Ezy hand truck will give you easy wheeling with these bulky objects and will keep your handling costs low. Bottlers, brewers, distributors, super-markets and delivery men are finding increasing use for the Wheel-Ezy. There is a use for at least one in every plant. Strong, lightweight and perfectly balanced, Wheel-Ezy handles loads up to 500 pounds with ease. "Step-Climber" feature makes it possible to go up and down steps in easy fashion. Now available in one and two handled models, open or solid plate nose. Write for literature and price lists — no obligation.

CHOICE OF WHEELS

AGH—Demountable Cushion rubber wheels . . . it's tough. MOCH—Moulded on Cushion Rubber Wheels, moulded to metal core. ABK—Plastic wheel with laminated fabric tread, moulded under heat and pressure. MRK—Resinoid Wheels made of sturdy canvas duck, macerated and moulded under heat and pressure. Plain or Roller Bearings. NICRO STEEL—Fine quality grain castings, full machined. Oilite Bearings, zerk lubrication. GP—General Pneumatic with 10" x 3.50" demountable rubber tires.

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STEEL FORGED CASTERS - TRUCKS - CONVEYORS - POWER BOOSTERS

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### NEWS VIEWS TRENDS

N EWS of the Industrial Packaging Exposition, which was held in Hotel Sherman, Chicago, April 24th-26th, because of exigencies of closing dates, etc., will be presented in the June issue of FLOW.

THE Re-Bo Manufacturing Co., New York, has announced that it has relocated its plant from Knoxville, Tenn. to Bedford, Va. after the purchase of the former Continental Can Company property in the latter town.

<sup>64</sup>O NE great postwar trend already manifested in the direction of increased packaging in consumer sizes at the source of supply, enhancing the original cost, but lowering costs at the retail level and often affording superior production enroute."

Not generally known is the fact that 15% of the prewar lumber supply was consumed by wooden containers, but during the war as much as 40% of all the lumber produced in the United States was used for this purpose.

"The increased popularity of the wirebound box promises that production, rather than demand, will set the limit on sales."—Domestic Commerce.

I N boxing and crating, metal containers and fiber-board containers will compete with those made of wood in the overall demand for lumber, and new methods of shipping, such as securing on skids or pallets, will compete with wood crating.—Domestic Commerce.

I N conjunction with the meeting of the National Canners' Association held in Atlantic City, The Automatic Transportation Company of Chicago, demonstrated its equipment to patients at the Thomas W. England General Hospital. It was demonstrated that jobs and opportunities for advancement can be had by veterans who lost arms in combat.

Robert M. Whitney, Automatic official in charge of the exhibit, said: "Many firms are now needing men to fill positions in their material handling programs and many of those firms desire to hire such men, since material handling with electric propelled equipment is one of the jobs these men can perform effectively." He also emphasized that such jobs could provide an entree into a broad field if any man wanted to work into the executive and technical phases of material handling, which he called the fastest-growing phase of industrial production.

E FFICIENT packaging methods and proper methods of shipment and tests for the determination of the exact type of package needed for any and all

classes of goods transported have been offered to shippers by the Shippers Advisory Board. J. E. Bryan, General Chairman, Room 2112, 59 E. Van Buren St., Chicago 5, Ill., can be written for free copies (in reasonable quantities) of this valuable memorandum.

The drop test method is presented which will show in advance of shipment whether the container and the inner packing used will give proper protection against damages in transit.

This is one of the projects of the Association of American Railroads in cooperation with many large shippers in the country.

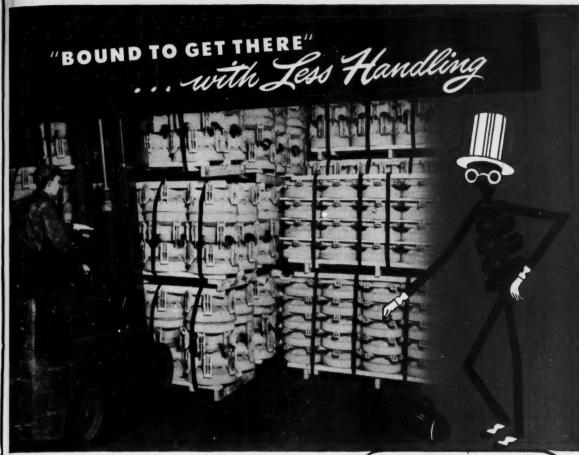
THE Bayway Terminal Corporation of Elizabeth, N. J., recently received an award from the U.S. Navy for "exceptional accomplishment in behalf of the U.S. Navy and of meritorious contribution to the national war effort." It also received an award from the Office of Civilian Defense for "the maintenance of a superior standard of protection and security... which stands as a mark of distinction in the nation's war effort."

In a recent survey prepared by the Electric Industrial Truck Association more than 66% of those firms who responded affirmed that the costs of transporting and handling materials are large items in their business, but they were unable to ascertain such costs as a separate element of total production expense. While most of the firms who replied stated that cost analysis records of the materials handling equipment were kept by their cost accounting departments, 25% said that the supervisor of equipment kept such records.

A complete picture of truck operating costs would include fixed and variable expenses and statistical data as to number of hours worked, idle time, "in shop" time, average cost of operation per 8 hour day and average cost per hour of each truck. Possibly within the near future some more adequate record systems will be developed for this impotrant phase of production efficiency.

A NEW Minimum Specifications Manual has been presented by the Wirebound Box Manufacturers Association, in which the packing of nearly every type of industrial product, from light ceramics to 500 lb. engine blocks, is presented. One of the purposes of this manual is to not only prevent shipping damage alone but also to reduce overdesigning of containers, which involves use of more or heavier box veneer than necessions.

(Turn to page 63)



# ACME Uni-Pak ...

Just what its name implies, several packages tied into one by Acme Steelstrap. The modern method of shipping a group of packages, semi-finished parts, or finished products... with less handling.

Illustrated above is a case in point. One man, a lift truck, and Acme Uni-Pak... the job is done in a fraction of the handling time required by cumbersome, old fashioned ways.

Yes, for complete shipping efficiency, for making safe shipments... ship Acme Uni-Pak with Acme Steelstrap. Look into this minimum handling method today.

DOC. Steelstrap REG. U. S. PAY, OFF.

# 15 MAN HOURS SAVED ON CARLOADS ACME UNI-PAK'D

A leading manufacturer and shipper says... "since using your Uni-Pak process, the time required by handling and loading car-lot shipments has been reduced the equivalent of 15 man hours per car. The number of cars loaded has speeded up accordingly."

NEW YORK 17

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ACME STEEL COMPANY

ACME STEEL CO. CHICAGO



# to get there

A method of preparina steel strapped cars in the shipment of drumsand pails.

### BY B. J. ROGGENBUCK

Traffic Manager Inland Steel Container Co., Chicago

HIPPING carloads of enameled steel drums and pails without damage is difficult under the best of railroading conditions. Pails and drums are cylindrical in shape and take up a large amount of space for their weight. The result is a relatively low density of weight and plenty of chance for damage in car bumping.

Through careful study and numerous experiments, Inland Steel Container Company of Chicago developed a method of bracing which makes speedy loading and unloading possible and, most important, makes our company's containers "bound to get there." This year, we will ship over 6,000 carloads with an amazingly low minimum of damage. In 1944, claims ran only 3.7 percent, which is exceedingly low on products such as steel drums and pails. This procedure also saved loading dollars for the shipper, and unloading dollars for the receiver.

### Loading the Barrels

With the present steel-strapping method, 120 minutes time of two men is all that is required to completely pre-strip, finish bulkhead-

ing, and completely brace the car; and 15 minutes of one man's time with a snipper and claw hammer is all that is needed to remove the bracing at the receiving end. If the steel strapping method were not used, additional dunnage lumber would have to be used as well as more time, with the added possibility of more damage claims. A saving of 80 board feet of lumber alone is achieved by the steel strap method.

In loading a 40' 6" long, 9' 2" wide, 10' 0" high car that is to contain 300 fifty-five gallon steel used.

drums, the following method is Starting at either end of the car the drums are rolled into an up-



right position, using the 3-2-3-2 method on the horizontal plane and the 3-2-3-2 method on the vertical plane. Loading in this manner progresses to the doorway. Then the doorway area is completely filled in the same way, thus utilizing all available space.

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Before the doorway area of the car is loaded, car blockers prepare this area for the bracing of the car. They anchor two 3/4" x .035" steel bands into the floor of the car. spaced in valley formed by two center drums and 6" in from the door sill. These bands then travel vertically to the ceiling of the car and across and down, to be later joined with short sections of band that have been anchored in a like position at the loading door.

Gate horizontals must be in line with the base of bottom drum-intersection of chimes of middle tier to top of top drum. A wooden gate consisting of two 2" x 4" verticals and four 2" x 4" horizontals is built into the door opposite the loading door. When the car is completed another such gate is fitted in, but not nailed to loading door. The



Draping car with %-in anchored to sidewalls

38

bands are then tensioned together about these gates and create an eflect of compressing the drums sta-



Starting the staggered 3-2-3-2 load in either end of the box car.

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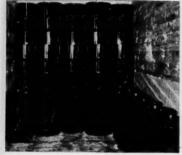
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This compression acts as a brace to withstand impact from either



A progressive step in the staggered 3-2-3-2 method of loading drums.

end of the car, which might cause the drums to buckle and ride upward at the center under impact.



This load of pails has reached doorway opening and is ready for insertion of fibre sheets for extension of load into doorway area.

The method of banding a load in this fashion also prohibits any of the drums from shifting sideways into the 6" space formed between (Turn to page 51)



The installation of a conveyor system involves more than a consideration of the quality and dependability of the actual equipment needed. Engineering proficiency not only in the design and construction of the conveyors, but also in their adaptability to the problem involved, is of equal importance. Proof of Logan's ability to profitably engineer conveyor

systems to countless handling problems is in evidence in many of the nation's major industrial plants.

LOGAN CO., INC., 558 Cabel, Louisville 6, Ky.

ALL OUR CONTROL WORLDLY GOODS
We owe to the FREE ENTERPRISE
SYSTEM

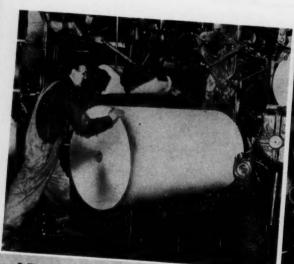
Logan Conveyors

This telescopic extension on the monorail system is used by Detroit Steel Products Co. for loading heavy crates. The movable rail is carried by two trolleys which ride the main monorail.

# 

Here are more examples of interesting manually operated equipment in action. See this department in the March issue of FLOW.

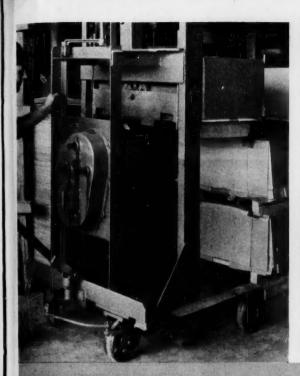






Dollies eight inches high, and others three feet high, are used by the Cleveland Plain Dealer, morning newspaper. The low dolly is on a level with the platform in the storage area where stock can be stored only two high horizontally. This dolly is also heavy rolls are handled in the very low headroom area.

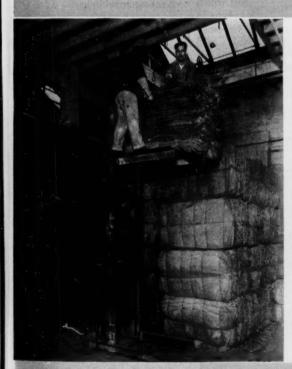
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Compact, palletized loads of tin plate are readily triple decked by this elevator. Photos this page, courtesy Barret-Cravens Co., Chicago.



In this warehouse, large bulky skid loads of paper are as readily "put up in the air" by this type of portable elevator.



Here, floor area is being saved in another operation. Baled bundles of burlap bags are stacked to a height of 15 feet.



Tobacco must be aged to have the proper mildness—and here large casks of it are being piled three high.

LOW



With a force of only 25 productive workers, the Wm. Moors Concrete Products Company manufactures thousands of cement blocks every day. Modern handling facilities have helped maintain this record for a number of years.

THIS interesting small plant is located at Fraser, Mich. It is an excellent example of what can be done in a small-scale installation with modern mechanical devices. For efficient handling has spelled success for this organization.

### Layout Designed for Handling

How is this accomplished? First of all, the entire layout was planned for flow of material. From the back of the property where the raw materials are stored, to the front where the finished blocks are tiered, a steady stream of material is produced. Secondly, when the need came for some special equipment to handle the materials, they were provided. Thirdly, this company is

constantly on the alert for new methods to solve the handling problems of the expanding business.

Toward the rear of the plant, sand and cinders are piled ready for loading into dump trucks, which move the material to the mixer. The trucks are loaded by means of portable bucket elevators, which can be positioned where needed. After loading, the trucks are driven to one of two locations. If the load is sand or cinders, the dumping is done over a grating of steel which is located over a belt conveyor in the ground. This carries the sand to a flight conveyor, which discharges into a mixing trough on the second floor. If the load is cement, it is dumped into a hopper installed nearby, and carried to the second floor in the same way.

Load of concrete blocks being carried by special truck to conditioning room.

Note that a light is mounted on the truck.



When these ingredients arrive on the second floor, the mixing procedure begins. Rubber belts carry 1

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Operator using double-hinged air hoist to load two concrete blocks on a five-tiered rack.

measured portions of sand and cement into a trough in which the material is pushed along by a screw conveyor. A small portion of water is added to form the correct consistency as the mixture is fed into a vibrating machine.

### Forming and Handling the Blocks

The vibrating machine shakes the mixture into a compact mass, while it is retained in a die having the shape of the finished blocks. Three blocks are produced at a time, which are removed on a tray, called pallet. The pallet is picked up by use of an air hoist which is attached to a column at the side of the machine. The hoist is fastened to a trussed bracket which in turn is hinged to another bracket of the same design, the latter being hinged to the column. This double hinge effect results in greater range for loading, and still provides the necessary rigidity.

The operator picks up three blocks and places them on a rack designed to hold 12 blocks on each of its shelves. The rack is made of welded angle iron.

A specially designed fork truck is used to remove the blocks to the conditioning rooms. The design netted a truck which had not only hydraulic lifting facilities, but also hydraulic steering. The machine can be handled with ease on sandy or wet ground.

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The lifting forks can handle up to three tons conveniently. The conditioning rooms have low ceilings which caused no end of difficulty, but with its low lifting arrangement this special truck raises the loaded racks not over four inches off the floor, and lowers them with equal smoothness. Since it is rather difficult to see through the pile of blocks ahead when positioning them in this room, a small headlight was mounted on the truck to shine between the blocks and aid the driver to outline the rack ahead. After conditioning for several hours, the blocks are removed and taken to a storage area toward the front of the property.

That's why the Wm. Moors Concrete Products Co. has been able to maintain a steady flow of cement products with no waste in man-

hours or effort.

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### FROM TILE TO FOOD PRODUCTS

DURING the war, the Cambridge Tile Manufacturing Co., Cincinnati, had to convert from its peacetime manufacture of tile to the compressing and packaging of food for overseas shipment. The transition created unusual produc-



tion and handling problems, and for a time lack of manpower and greater handling requirements threatened production quotas. The problem was remedied with the pallet-and-fork-truck method. The truck shown now serves the entire plant, and has cut handling time from 1.88 to .75 manhours per ton.—Courtesy, The Towmotor Corporation.



# REVOLVATOR PORTABLE ELEVATORS

# PILING FROM RAW MATERIALS TO FINISHED GOODS

There's a type to fit your special needs and save you time, space, labor and money. Standard models from 500 lb. capacity hand machines with or without hinge up to electric drive telescopic models of any practical capacity and height. Revolvable and non-revolvable bases; platforms to suit type of material handled.

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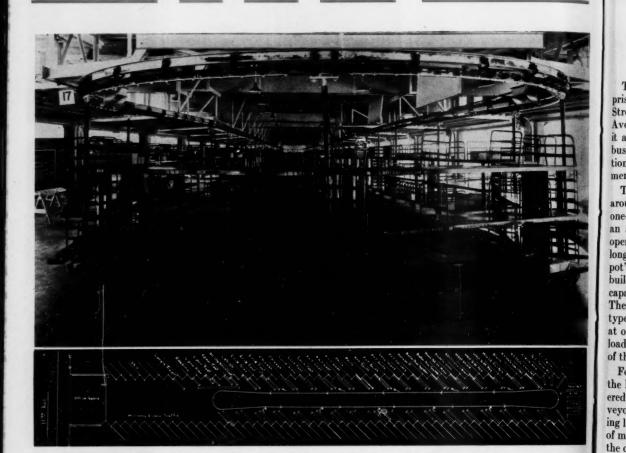
REVOLVATOR CO.
DESIGNERS AND MANUFACTURES OF MATERIAL HANDLING EQUIPMENT

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Since 1904

WHEN MOVING 20,000 PIECES PER HOUR ....

# SPEED IS OF THE ESSENCE



The photo above shows the drag-chain-propelled "belt line" of three-deck trucks used in this outstanding assorting operation. The view is from one end of the line, looking down the 450-foot length of platform. Directly above: Flow sheet shows extent of oval-shaped overhead trolley conveyor and position of gravity lines at the doors. Arrows indicate "outbound" operation.

F YOUR wife or daughter owns ready-to-wear apparel made in New York City's garment center, there's a good chance that the garments were handled through the facilities of the 11th Avenue Assorting Station of the Railway Express Agency. This depot was especially designed to handle this garment business, and it assorts and moves better than 50 per cent of that traffic. This famed garment center, which supplies the whole country with its wares, is concentrated in the area from 35th to 40th Street and from 5th Avenue to the Hudson River. The assorting station is strategically located, occupying the entire block at 11th Avenue and 42nd Street.

This facility of the Express Agency has other claims to distinction. For if your wife's or daughter's housedress or negligee passed through this station, the garment was given a ride on a "belt line" of specially designed 4-wheel trucks propelled by an overhead chain conveyor. There are many dragchain conveying systems in use, but the engineers of Railway Express Agency developed this principle for

handling LCL shipments, and the company is the only one in the country that uses such a system for assorting and transporting common carrier shipments. More, the installation seldom stops. The cars keep traveling along the elliptical circuit in the center of the platform, seven days a week, 365 days in the year. Railway Express has twelve of these overhead chain conveyors in operation at various terminals and stations, but the rate of handling is higher at the 11th Avenue Station than at the other installations.

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Several things are outstanding about this application of a drag-chain conveyor. Among them: It's the most modern operation of the Railway Express Agency, and it has the highest capacity of any express station in the world.

### Plant, Function, Volume

The district of this depot comprises the area from 34th to 125th Street and from the west side of 5th Avenue to the North River. Thus it also handles some private house business as well as a minor proportion of automobile accessory shipments.

This station, especially designed around this conveyor system, is of one-floor construction. It is purely an assorting function, not a train operation. The building is 600 feet long and 200 feet wide. (The depot's garage is housed in a separate building on the premises and has a capacity for servicing 300 trucks.) The platform is of the saw-tooth type, with a capacity for 100 trucks at one time, 50 loading and 50 unloading. All doors are of metal and of the roll-up type.

Four hundred and fifty feet of the length of the platform are covered by the monorail trolley conveyor, as shown in the accompanying layout sketch. Portable sections of magnesium roller conveyor serve the central conveyor system as feed and discharge lines. The remaining 150 feet of "open" platform (not covered by the chain conveyor) are devoted to millinery and other bulky shipments that are not readily handled on the shelves of the circling trucks.

The business handled is spoken of in terms of shipments, not tonnage. A shipment may consist of one piece or 100. All operations and costs are based on "shipments," of which the depot will handle about 2,000,000 in a busy month. This may amount to between three and four million individual pieces. Note: Express differs from freight in that it moves exclusively on passenger and special express trains. Speed is the first consideration. We shall presently see how other phases



Pieces move from over-the-road trucks via light-metal gravity conveyors to bins in moving cars, shown at left of photo.

This system, operated by the Railway Express Agency, plays an important part in the nationwide distribution of women's apparel made in New York City's garment center. A "belt line" of 4-wheel trucks, propelled by an overhead drag-chain, expedites the assorting of millions of packages monthly, speeding them to the rail heads in minimum time. And "speed" is the company's main product.

Close-up photo shows pipe separators, and stencilled locations according to names and numbers. Article explains location system used.



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of the operation are designed for speedy handling, without waste motion and effort.

The depot has two major junctions:

1. Outbound Traffic: This covers all business receipted for (collected) in the district and brought in by vehicles to be assorted to the ten railroad terminals over which

sight reminds the onlooker of a toy electric train traveling around on its oval track.

The conveyor tows 76 cars, each 10 feet long and equipped with three shelves or decks which are divided into bins by pipe partitions. The width of the trucks is three feet, and the top shelf is 50 inches above floor level. Three shelves on

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### Mechanically Speaking

The overhead chain conveyor is driven by a 20 h.p. motor with a fluid coupling and relay magnetic starters, which provides a very gradual start, and hence no packages are shaken off the cars when the system starts up after it has been stopped momentarily. This saves both time and damage. In case of a breakdown, a second motor is available, and the equipment can be switched from one to the other with slight interruption.

Since the system operates almost continuously, the Express Agency's engineering department has made the following provisions

for preventive maintenance.

Lubrication is accomplished on a schedule while the line is in motion. Trucks are removed and replaced in the line without stopping the machine. Worn parts such as axles, bearings, wheels, etc., are quickly replaced.

All wheels on the trucks are rubber-tired. This is designed as protection for the cement floor; it also "cushions" the trucks and provides a relatively quiet operation. At the front end of each truck, propelled by the conveyor system, is a guard ("cow catcher"), whose lower end extends to within a fraction of an inch above the floor. This guard serves to push out of the way any packages that may have fallen into the path of a truck, thus helping prevent pos-

sible damage to the goods being handled.

The gravity conveyor sections used for unloading and loading the vehicles and for transferring the pieces to and from the circling trucks, are constructed of a light-weight magnesium alloy. The gravity line at each door consists principally of a 10-foot section. Since the weight of a 10-foot section is 70 pounds, it can be readily carried or moved when the need arises. These magnesium roller conveyors were also pioneered and designed to the specifications of Railway Express engineers. Some 40,000 feet of them are in use at hundreds of Express Depots on a multiplicity of jobs to expedite the handling of shipments in and out of street vehicles and express

the shipments will leave the city.

2. Inbound Traffic: The cars are unloaded at the rail terminals and this inbound traffic is there assorted according to delivery districts. Pieces destined for the 11th Avenue Assorting Station district are sent to it for assorting into the street delivery vehicles.

### The Equipment, Operating Method

The closed circuit of the overhead chain conveyor measures about 960 lineal feet. The constant motion of the trucks, traveling at the rate of 125 feet a minute, has a fascination all its own, and the each truck provide maximum capacity per unit. The trucks and conveyor were built to the Railway Express Agency's design and specifications.

There are two breaks in the "continuous belt line" of trucks. The latter are arranged in two trains of \$8 trucks each, with an open space at two opposite ends of the line. These openings provide access to the floor area within the truck train, which is used for temporary storage.

The individual trucks are attached to the conveyor by means of a male pin extending from each load bar on the overhead chain into

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the sleeve coupling on the mast at the front of the truck. And from the bottom of the mast a pin drops into the coupling of the leading truck. In this way secure coupling is provided both between truck and conveyor and the truck units, which constantly move packages from the unloading to the loading positions.

The movement of the goods is from one side of the platform to the other. The merchandise from the motor vehicles is unloaded onto the portable sections of gravity conveyor, which are spotted at each door. At the end point of each gravity line an operator transfers the pieces to the proper bins on the conveyor trucks as they move past within convenient reach.

"Proper bins" in the preceding sentence indicates that the pieces are not placed on the moving trucks indiscriminately. A look at the closeup photo of the truck will help explain the location system used. The truck shelves and bins have both numbers and names (of rail terminals) stencilled along their edges. Inbound shipments are assorted on the shelves according to number. For the more numerous outbound shipments, the names are used (according to the 10 different rail terminals through which the shipments are forwarded). The six shelves divided into bins on each train of two trucks make up a complete assortment to the 10 different rail terminals (including some special bins). Since 38 two-car trains are in constant operation, a bin passes a given point every eleven seconds. Thus, if one bin is full, the operator need only wait eleven seconds for the same bin to come to him on the next 2-car train.

This gives a general idea of the over-all operation; specific details of the handling procedures are discussed in the following two sections.

### Outbound Traffic

As indicated, the pieces from the trucks are unloaded onto gravity roller conveyor sections, and from the latter the goods are assorted into the proper compartments on the circling cars. Thus, as the driver unloads his vehicle, an operator at the end of the gravity line at the same time keeps removing the pieces—keeps moving them toward their ultimate destination.

In other words, the material moves out at the rate at which it is brought into the depot. That's the schedule, and the conveyor system makes it possible to maintain it—without waste motion.

Meantime the unloading operation proceeds at the other side of the platform where operators, called pickers, pull the pieces off the traveling trucks from the bins each is serving. The packages are placed on gravity roller sections, on which they roll into the outbound vehicles where they are hand piled. As in unloading, there is no waste effort or rehandling.

In this manner the material unloaded at one side of the building is loaded out at the other side, with the circling cars moving as a belt line and connecting all stations on both sides of the platform. This explains why the loading of an average vehicle (with 600 pieces) takes only about 30 minutes.

Another factor contributes to the speed and smoothness of the operation. This is the conspicuous absence of clerical detail. The pieces

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are counted into the outbound vehicles, and the loaded truck is then locked and sealed (with a numbered seal). A record of the number of pieces (along with a seal number) is dispatched to the rail terminal. This method avoids clerical red tape that tends to delay handling.

Only pieces of nominal valuation are moved on the conveyor system, which means practically all the business handled. The exceptions are a small percentage of items, which are handled separately through the "value room."

Here are a few further details which contribute to the smoothness and speed of the operation. The trucks are equipped with vertical separators, which are removable and adjustable sideways, making the bins for the varying separations required by the routing. Since the middle shelf is also removable, a "bulk car" can readily be prepared for the handling of large and bulky pieces.

The masts of the cars are painted with blue and red bands. Red indicates the first cars of a train, blue, the second car. A double stripe of red and blue is applied to a bulk car. Thus an operator working at a designated loading place need only watch one or the other color, according to the type of operation.

### Inbound Traffic

With certain exceptions, parts of the procedure just described also apply to the inbound operation. On these separations, usually 12 overthe-road vehicles are unloaded at one time. These units are likewise unloaded onto gravity conveyor lines, and the operators then transfer the packages to the circling trucks.

But, as previously noted, the pieces are now assorted onto the shelves according to number, not according to rail terminal name. And the numbers on the shelves correspond to post numbers on the platform. A post usually comprises three delivery sections.

For example: Packages placed on No. 5 location on the shelves are taken off by the operators stationed at No. 5 Post. A delivery clerk stationed in each section strips the waybills off the packages and charges the shipment on the chargeout form to the delivering driver.

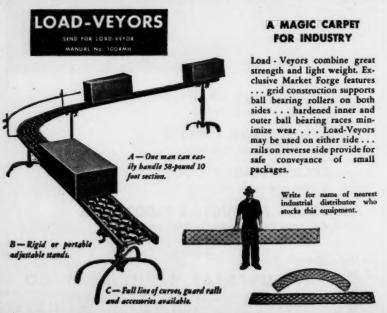
At scheduled time, the driver receipts for the deliveries that are charged to him and then proceeds to make his deliveries. If the loading is completed ahead of schedule, the unit will pull out when ready. This operation on each delivery section has three scheduled runs, as follows. One at 8:30 a. m., the second at 10:00 a. m., and the third one at 11:00 a. m.

When the deliveries are completed, the gravity rollers are set up with the incline in the opposite direction, in preparation for the outbound operation (which represents about 90 per cent of the total volume). It takes about one hour to convert the plant, which means chiefly placing the gravity roller conveyors at the doors, so that they will be properly inclined. Meanwhile the overhead conveyor system keeps running. The scheduled time for the outbound operation starts at noon and lasts until 2:00 a. m.

In the "open" part of the plat-



# MARKET FORGE COMPANY STANDARDIZED MATERIALS HANDLING EQUIPMENT





MARKET FORGE COMPANY MATERIALS HANDLING DIVISION 60 GARVEY ST., EVERETT 49, MASS

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My company's name  My company's product			

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BUSINESS REPLY CARD NO POSTAGE NECESSARY IF MAILED IN THE U.S.A.

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1240 Ontario Street Cleveland 13, Ohio

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form, not covered by the conveyor system, the goods are moved on . Hat trucks and gravity conveyors.

### "It Would Be Difficult Without It"

It would be difficult to visualize this assorting operation without the conveyor system which can and does handle up to 20,000 pieces per hour. To handle as many as three to four million pieces a month with-

### Safe Handling for Glass

The two-way grapple shown provides an easy and quick method for hoisting and positioning boxes of finished glass. It is constructed of 34 stock with a 32-inch fillet weld at the joints. Nine 32-inch holes are drilled in each half of one grapple. The gripping spurs which are inserted in these holes are threaded on one end, while the spurs are drawn tight against a

out it would require a greatly augmented staff. The resultant confusion and crowding would of themselves cause difficulties that could only be solved by providing a considerably larger working area.

With the present facility—the most modern one operated by the Railway Express Agency—the packages are moved in a continuous and orderly stream from unloading to loading stations. The material is moved off the trucks at the same rate at which it is put on. As soon as an operator places a

piece in a compartment of a passing truck, his job on that piece is done.

Thus the system admirably fulfills the function for which it was designed—to speed up the Express Agency's service at the largest manufacturing center for women's apparel. The combination of the overhead chain conveyor, towing multiple-deck compartment trucks, and the light-weight roller conveyors, gives the 11th Avenue Assorting Station the highest capacity—20,000 pieces per hour—of any express station in the world.



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shoulder toward the point. This permits easy removal for sharpening or replacement. A ½-inch round handle is welded to the top for easy handling hefore and after lifting

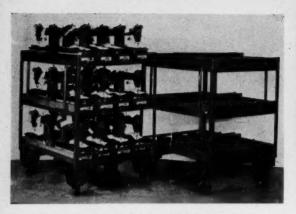
before and after lifting.

The ring attached in the eye at the end allows the lifting chain to ride free until contact and tension are established. Depending on the length of this chain, almost any size box can be handled. Tandem arrangements can be made by using a series of such grapples from a common lifting point. Stacking is also quite simple with this device, because the grapple can be attached to the top of the box without depending upon a support from the underside. The average weight per box is about 300 lbs.

In this crating and shipping department thousands of boxes are thus lifted and stacked by an overhead crane. This method affords neat and tight tiering avoiding danger. Courter, The Feet March 1989.

tight tiering avoiding danger. Courtery, The Ford Motor Co.





Live-skid shelves are used for in-process handling of sewing machines in machining, assembly and adjusting departments.



They are carried between departments by platform-lift truck two to four at a time, as shown in the photo above.

### PIONEER IN MODERN HANDLING

(Continued from page 31)

dling by means of powered platform-lift industrial trucks. The usual procedure, when work in one department has been completed, is to put the boxes in the skid-racks and place the racks beside the aisle at an angle of approximately 30° so as to facilitate pick up. Usually, three to five of these racks are carried at one time.

When highly-finished parts reach a finished or semi-finished state, the stock-boxes are provided with dividers, and those of steel construction are also lined with corrugated board to protect the work. Examples are parts leaving the japanning and enameling operations or the buffing operation after plating.

The contents of one stock-box also constitute the approximate quantities in which numerous parts are shipped. As a part of the last operation, such parts are transferred from steel stock-boxes to cardboard shipping containers having approximately the same dimensions. These containers are then carried to the stock rooms in the same skid-racks used for the boxes.

### For Interchangeable Handling

A handling unit used for somewhat larger parts and for parts produced in larger unit quantities consists of an interlocking tierable skid box having measurements 36 by 20 by 24 inches deep, 10 cubic feet. Like the stock-box, it is of both steel and light-weight plywood steel-reinforced construction. It is

also varied in design in that some are four-sided both with and without a crosswise partition, others are three-sided, while others, used for handling of dry sand cores in the foundry, are open front and back, with ends 24 inches high.

This is the handling unit, previously referred to, which is provided with 12-inch underclearance for battery platform-lift and handlift truck handling, yet can be tiered by fork-lift truck with only 31/4-inch clearance between the tiered loads. This is accomplished by the interlocking skid construction shown in the illustrations.

Aside from saving space, this construction provides a full 83/4-inch interlock between tiered units thus rendering tiering accidents virtually impossible. A feature which contributes further to safety and facilitates the tiering operation is the downward outflaring of the inner sides of the skid runners.

Much of the work handled in

For longer hauls between adjusting and pack-ing departments, the live-skid shelves are pushed into a boxcar on plant railroad.



these units originates in the foundries, the sheet-metal press shops and the forge shops. When the work is to go immediately into production, the boxes are picked up by platform-lift truck and carried, four or five per trip, to the machining departments. If the work is first to go into temporary storage, the boxes are picked up and carried in the same manner to storage, where they are tiered three to six high by fork-lift truck. If the work originates in the foundries (where the volume of work is substantially greater than in the forge shops or · press department) the boxes going into temporary storage are first tiered two to three high by fork-lift truck and carried to storage, 10 to 15 boxes at a time, by batterypowered platform-lift truck.

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The light-weight interlocking tierable skid boxes are used also for shuttle service between Elizabethport and the Finderne, N. J. plant of the Diehl Manufacturing Company, electric-motor manufacturing subsidiary, and the Bridge port, Conn., sewing-machine-manufacturing plant. In this operation, they eliminate manual handling during the loading and unloading of the highway trailers used for the interplant shipments. During the war, they were used for similar shuttle service to and from subcontracting plants.

The stock-boxes with their skidracks and the interlocking tierable skid boxes serve for the handling of the majority of small parts. Although the foundries, forge shops and sheet-metal press shops, where most of the parts originate, are lo cated on the ground floor, many of the machining departments are

used two each and 6

cated on the upper floors of four five-story and one six-story buildings, all interconnected.

Inter-Departmental Routing

Of these, three built before 1899 were not originally provided with elevators of sufficient size and capacity for powered industrial trucks. The fourth, erected in 1900, and the fifth, a six-story building completed in 1907, were equipped with elevators capable of handling industrial trucks with limited loads, but not the larger platform-lift trucks now in use. These carry the loaded stock-box skid-racks and the interlocking tierable skid boxes three to five at a time, as well as other types of skid loads in multiple. These trucks are of 6,000pound capacity, have lift-platforms 91/2 feet long, and are of the sixwheel type. The upper floors of all five multistory buildings opened to this traffic in 1937 by an elevator of 20,000-pound carrying capacity and of ample size to carry two of these loaded trucks at a time. It has been centrally located.

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The interdepartmental trucking routes have been sectionalized and a clear area 30 by 30 feet established on each floor beside the main elevator shaftway to serve as a route junction and skid-load breakbulk point. At these areas, skid-loads are left by trucks operating on certain routes for pick up by trucks serving other routes.

For the handling of heavier work, usually on the ground floor only, skid platforms, skid boxes and liveskid boxes of more conventional sizes holding up to 30 cubic feet are

(The second and concluding part of this article will appear in June.

—Ed.)

### WHEN YOU WANT IT . . .

(Continued from page 16)

placed on the cars and transported to this warehouse. Inside, the material is handled by one 5-ton, cab-controlled crane and two 5-ton pendant-controlled hoists.

Two other warehouses across the street from the main building are used for sheet steel. One contains two 10-ton cab-controlled cranes, each servicing a bay 160 feet long and 60 feet wide. The other building measures 215' x 60' and has a

7-1/2-ton cab-controlled crane.

Tubes are stored in the fourth building, and an underslung, pendant-controlled hoist takes care of the handling needs by means of chain falls.

Thus the coordination of cranes and cable cars, in conjunction with specially designed accessories, makes possible easy handling of heavy and bulky loads at the Builders Structural Steel Co. The facilities also overcome the handicap of a building constructed on a slope.

### BOUND TO GET THERE . .

(Continued from page. 39)

the inside wall and the closed door of the car.

This unusual and extremely successful method worked throughout the war years for Inland Steel Container Company, and is still working successfully under peacetime conditions.

### **Preparing Car for Pails**

The procedure for bracing the pails is equally simple and as successful, but the method differs as follows:

The car is draped in advance with four 3/4" x .035" bands that are anchored to the side walls in either end of the car. These bands are spaced evenly and the anchor plates attached through the siding into the studding of the car about six ft. from the door frame. The loose ends of the bands are stapled to the side walls of the car in parallel lines and folded back out of the way at the door frame.

In loading pails in a 40' 6" long, 9' 2" wide, 10' 0" high car, the pails are stacked in the following man-

Load nine five-gallon pails in a row across the end of the car with handles away from the wall. Then load a row of eight pails in front of the row against the wall with handles toward intervals of back pails. In the average box car, all five-gallon pails are loaded nine high in this manner. The height of the load, however, depends on the car used and the size and style of pail.

After the limit has been reached and the gate is ready to be placed in position for bracing either end of the car, a fiber sheet is placed between the load and the gate. This gate is constructed of 2" x 4" verticals and 2" x 4" horizontals, with the horizontals placed so they will contact pails at the intersection of each pail—the chimes—the strongest part of the container.

The gate is anchored to the floor of the car by fastening an "L" shaped anchor to the center vertical 2" x 4" where it meets the floor. The four bands are then tensioned across the face of this gate with four stretchers in order to gain equal tension on each band.

This style of loading is proving both effective and economical by our company.

Photos in this article, courtesy Acme Steel Company, Chicago.



Here's one of dozens of jobs around the shop where

# LYON - Raymond Hydraulic Elevating Table



- 1. Speeds up handling.
- Saves manpower.
- 3. Protects men and expensive fixtures.

One man transports, elevales and positions this massive trunnion jig for mounting on machine.

e Many other examples of work positioning in our new bulletin #141. Shows labor-soving applications in actual shop views . detions in actual shop views . detions of equipment for specific conditions . convenience and safety sions . special variations that features . special variations that features . special variations that may help youl it's a bulletin filled with real working information.

Write today for your free copy.

LYON-Raymond corporation.

497 Madison St.

GREENE N. Y.

MAY, 1946

# It's An Easy Job for FLIGHT-VEYOR



An all purpose Industrial Conveyor that's a real time and money saver. Moves ashes, cinders, grain, chemicals, metal, aggregate, clay, coal, etc. Equipped with 134" high, chain drag-flights. Four sixes: 8 and 12 inch widths, 13 and 20 foot lengths. Raises material up to nine feet with 13 foot model and up to 14 feet with 20 foot sixe. Where a belt is desirable, use CON-VAY-IT.

Manufacturers of Coal-Veyor, Coal-Veyor, Jr., Con-Vay-It, Flight-Veyor.

### AMERICAN CONVEYOR COMPANY

1107 W. Adams Street, Chicago 7, Illinois Please send full information on

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City &	State.	 		 	 							

### **ENERGY SAVER**







For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

### HYDRAULIC ELEVATOR

THE Revolvator Co. announces a hydraulic elevator for servicing power trucks within a factory. The platform consists of one longitudinal H-beam and one transverse H-beam. The tops of these beams



are flush with the floor when the elevator is not in use. A steel safety guard drops to vertical position when the elevator is raised, the bottom of the guard resting on the bottom of the sump pit. The elevator is raised by forcing oil under pressure into a ram, the same oil cushioning the load when lowered.

### FLOOR PLATE DECK TRANSPORT

THE floor plate deck transport made by the Factory Service Company is the foundational unit of the company's Turner System of material handling. The transport can be moved in restricted space by hand jimmy, power lift truck, crane or conveyor, it is stated. Steel or wood bin sections or section trays lock one on another on the trans-

port for vertical expansion. The non-skid floor plate is welded flush with the top of the chassis on the



angles of the frame. Embossments provide point contact with hot materials, and the air space prevents warping, according to the company's announcement. The unit weighs 185 pounds.

### **ELEVATING CONVEYOR**

THE Island Equipment Corp., New York, is offering an elevating conveyor known as the "Island Ultimate Belt Booster", used for conveying packages, boxe, cartons, or any other type of solid article, from one level to another.

It consists of an adjustable frame which can be elevated from 10 to 45 degrees, the maximum elevation being 16 feet. The endless cleated belt is operated through a chain drive by an electric motor which is a unit of the frame. The fingerty control switch is conveniently located at one side near the bottom of the conveyor. The belt travelsates 50 feet per minute. The cleats are on five-foot centers, but they can be supplied at any distance.

### BATTERY CHARGER

A NEW single-circuit batter charger for 60-cycle, three

# ANNOUNCEMENT to the Materials Handling Industry



Salsbury Motors, Inc., as of April 1, 1946, acquired from the Nutting Truck and Caster Company all manufacturing and sales rights on all Salsbury materials handling equipment.

Salsbury Turret Trucks have been completely redesigned and re-engineered. They are now powered by the Salsbury 6 hp Engine, are equipped with a more rugged Salsbury Automatic Transmission and Automatic Clutch. This power package guarantees speedier horizontal movement of materials, increased stability and sustained performance. Salsbury Turret Trucks will negotiate 15% ramps with load and driver. Rated load capacity is 4000 pounds.

4 models—platform, pallet, cargo and tractor—will be completely manufactured and sold by

### SALSBURY MOTORS INC.

A Subsidiary of Northrop Aircraft, Inc.

4464 District Boulevard, Los Angeles 11, California • Factory at Pomona, California

FLOX MAY, 1946

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phase power supplies has been developed by the Electric Products Co., Cleveland. The equipment includes a vertical motor-generator,



a full voltage magnetic starter, and a unit-mounted automatic panel with a six-foot charging cable. According to the company, the charging current begins automatically at the proper value. The equipment shuts down in case of power failure, and when the power is restored the charging is resumed. The charger shuts down completely when the battery is fully charged.

### **ALUMINUM LIFT PUMP**

THE McIntyre Co., Newton, 1 Mass., has announced a series "100" power lift pump. The new units are said to deliver from 1/2 to three gallons of hydraulic fluid per



minute at 1750 RPM for continuous duty against pressures up to 1000 PSL. Pumps are of lightweight aluminum construction with nitrided nitralloy gears and shafts. They are 31/4 inches high, 21/2 inches wide and 23/4 inches deep. Available for direct motor, flexiblecoupled drives, they can also be supplied for all types of standard drives and a variety of mounting conditions. Power requirements vary between .40 and 2.25 H.P. for various units at 1000 PSI.

### RUBBER-TIRED WHEELS

THE Fritz Zeibarth Co., Rialto, Calif., is producing a new line of rubber-tired wheels (96 different styles and sizes) for light-duty uses. The line includes the deluxe ball bearing, standard ball bearing, deluxe sleeve oiless bearing and the standard sleeve bearing wheels. These may be had in steel as well as plastic.

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### SAFETY CARGO HOOK

NEW safety cargo hook of the American Chain Ladder Co. New York, designed for transferring Navy supplies and ammunition at sea underway, is reported to be applicable to many hoist and handling problems. In constructing this device, the company claims it



RATHBORNE, HAIR AND RIDGWAY COMPANY

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the bas made ample provision for overbads. Tests are said to show that the hook will tolerate loads exceeding 25,000 lbs. It features the patented self-mousing action which prevents hook straightening and load slippage. It is made with a grab opening of 3 7/16", and the diameter of the bail opening is

### PORTABLE CONVEYOR

PRODUCTION of a rustproof, dustproof, portable conveyor has been announced by the E. W. Buschman Co., Cincinnati. The new unit is claimed to be fully protected against conditions encountered in wet, dusty and corrosive locations as well as out-of-door uses. The wheel treads and hubs are protected with a heavy zinc plate. The side discs of the wheels are red baked enamel. A special inner seal excludes water, dust, grit or other harmful foreign matter from the full ball bearing.

The conveyor is furnished in the same models as those of the company's standard line, and is interchangeable with Buschman standard portable conveyors and accessories.

### INDUSTRIAL TIRES

INDUSTRIAL tires made with a synthetic rubber compound to resist the destructive action of oils, greases and salt brine, as well as other severe service conditions, are announced by the B. F. Goodrich Co., Akron. The special compound can be furnished on industrial tires of all standard sizes in both the Vulc-On and Pressed-On types manufactured by the company, according to a recent release.

### CONVEYORIZED WORK TABLE

AN all-purpose conveyorized work table for assembly, inspection and packaging operations is being manufactured by the Island Equipment Corp., New York. According to the company, the new unit, called a "Unitable," can be lengthened, shortened or moved with ease. Side leaves can be added or removed from either side. Any required combination of units involves only the removal and application of a few bolts. Small power tools can be mounted on the



This up-to-the-minute newspicture magazine shows how wideawake management in many lines of business is utilizing palletized

unit loads and fork trucks . . . to end the burden of costly manual methods and speed production.

### GOOD NEWS FOR HIGHWAY SHIPPERS

Mechanized handling made available to highway shippers by the new Clark Trucloader Method.

Clark builds GAS AND ELECTRIC POWERED FORK TRUCKS
AND INDUSTRIAL TRACTORS

# CLARK TRUCTRACTOR

Division of CLARK EQUIPMENT COMPANY

BATTLE CREEK, MICHIGAN

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- ☐ HAVE YOUR NEAREST FIELD ENGINEER CALL.
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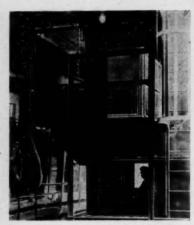
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frame or side leaves and hung directly over and a few inches from the point where needed.

### CONDITIONING UNIT

A NEW air-cooled conditioning unit for crane cabs working over ingot molds, soaking pits or vats where acid or other fumes are pres-



ent, has been announced by the Dravo Corp., Pittsburgh. The unit, which is fitted to the top of the cab, is self-contained. The air supplied to the cab is said to be cooled, cleaned and constantly circulated. Dust and smoke are dissipated and acid fumes eliminated by a special fume absorber.

### COIL STEEL TRUCK

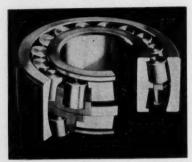
AN improved coil steel truck, made by the Palmer-Shile Co.,



is designed for loading and handling of coil steel from one department to another within the plant. As the coil is rolled against the rear or loading end of the truck, the truck end settles down to take on the load and then automatically straightens out again as the load rolls onto the truck. A one-inch dip in the floor of the unit is said to hold the coil in place.

### ROLLER BEARING

THE Bantam Bearing Division of the Torrington Co. announces the production of a self-aligning spherical roller bearing. It is said to be adaptable to heavy-duty per-



formance in a wide range of equipment, including machinery used in paper mills, steel mills, oil production, mines and quarries. Other features, the company points out, are two-directional thrust, high radial capacity, high thrust capacity and unit construction for easy in-

stallation. The new bearing will be produced in a full range of sizes from 1.5748" bore upward.

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### **ELECTRIC CABLE HOIST**

THE Lisbon Hoist & Crane Co., Lisbon, Ohio, has introduced a Bob Cat Model of electric hoist. According to the company, it is small in overall dimensions and is made practically in three sections, permitting complete and easy access to any part by the removal of about four bolts.

Made entirely of steel forgings and castings, plus the cable, the hoist contains ball bearings throughout. The motor is entirely enclosed in a drum, with patented heat dissipation construction and connection. The gears are all heat treated alloy steel, states the manufacturer.

### CONVEX MARKING DEVICES

A NEW line of convex marking devices for stamping part num-

### RACK SAVES PACKING DOLLARS

THESE refrigeration compressors, used for commercial deepfreeze cabinets, arrive by the rackful, 25 to a rack. The compressors are bolted to the angle iron frame, which permits the units to be removed quickly and easily. The caster-mounted rack provides the further advantage of mobility. In loading at the sup-



plier's plant, the racks are simply rolled into the outbound vehicles. At the receiver's plant, they are as readily wheeled out and moved to storage or directly to the assembly line. Previously, the compressors arrived at the assembly plant individually packaged. The present method effected a saving of \$1.00 per unit, which adds up to an appreciable total over a year's time.—Courtesy, Brunswick-Balke-Collender Co., Muskegon, Mich.

56

bers, serial numbers, dates, etc., on the periphery of cylindrically shaped parts, has been introduced by New Methods Steel Stamps, Inc., Detroit. According to the company, this new marking device for hand or machine stamping is of rugged construction, and the type may be changed speedily. Interchangeable steel type characters are held securely in place by a steel plate attached to the body of the holder with two set screws.

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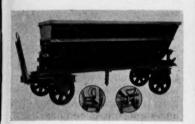
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### SIDE DUMP TRAILER

A RECENT addition to the material handling equipment manufactured by the Palmer-Shile Co., Detroit, is the improved side dump



trailer. It is equipped with geartype rockers and dumping is controlled to either right or left side, as desired. An automatic coupler at the rear permits the use of the trailer in train hauling. Fifth wheel construction aids in making short turns, according to the announcement.

### INDUSTRIAL TRUCKS

A new ten-ton capacity industrial truck driven by means of storage batteries and electric motors is being manufactured by the Elwell-Parker Electric Co., Cleveland. Features pointed out by the company are compactness, power, simplicity, instant responsiveness, ease in maneuvering, smooth, quiet operation, safety and economy. Overall length is 147 inches, width 45 inches. It is steered by means of all six of its wheels.

### STENCIL BRUSH

A T-HANDLE fountain brush for stencil marking is now available from the Marsh Stencil Machine Co., Belleville, Ill. According to the company, it is especially designed for use on vertical and floor level surfaces. Construction of cast aluminum is said to require less effort in handling. A hollow handle



provides an ink reservoir sufficient for marking 500 stencils before re-

### ERRATUM

In the April issue, FLOW announced in error that Curtis P. Whiteley had been named factory sales manager of the Automatic Transportation Company, Chicago. Instead, Whiteley had been appointed factory sales engineer. He assumed this new post with the Automatic Transportation Company after serving as co-director of material handling for the General Cable Corp.



# RUST-PROOF DUST-PROOF

Ideal for "TOUGH" Conditions

Here's a new addition to our regular line . . . "Red Wheel" portable Conveyors are corrosion-proof, made specially for damp or dusty locations. They are INTERCHANGEABLE with the standard Buschman Conveyors, Couplings, stands and

other accessories. "Red Wheel" Conveyors are not affected by moisture, dust, grit or fumes.

To assure rust protection, wheel tread and hub are heavy zincplated, side disc is red baked enamel. Full

baked enamel. Full ball bearing is sealed against harmful elements. For information on this and standard conveyors—write for Bulletin 10.

Representatives
in all
principal cities.

THE E.W. BUSCHMAN CO.

WINTON PLACE, CINCINNATI 32, OHIO

MAY, 1946



By CURTIS H. BARKER, Jr., Consultant



From an address given by the author at the A.M.A. Packaging Conference, Atlantic City, April 2 to 4.

OSTWAR handling developments have brought on a period that can truly be called "The Material Handling Era." Never before has any one function of business received such sudden and widespread consideration as is today being focused on the handling of material. The largest as well as the smallest concerns realize the importance of bringing their material handling and the physical distribution of their products up to date. Presidents, board-of-director members of financial institutions and operating men of practically all levels and responsibilities are showing a keen interest in the subject. This phenomenal development is the result of the following factors:

1. The lack of realization of the potentialities in the past due to concentration of many other pressing problems closer to top management.

2. Results of practices adopted by the armed services being brought home to practically all industries.

3. Increases in output of men and machines under stress of war, which resulted from relieving operators of all handling possible, with an accompanying enlightenment regarding handling labor costs.

4. Higher labor costs for some time to come.

5. The new high value of all building space.

6. Cries for lower distribution costs.

7. The reduction in spread between cost and selling price by governmental edict. This calls for the greatest efficiency in handling.

8. Reduction of damage and pilferage by reduced handling.

### Unit Load Is Versatile

Just what has been happening since V-J Day that might affect the future program of almost any concern? By far the most significant fact is literally thousands of companies are starting out with an earnest endeavor to take advantage of the unit load wherever possible.

A unit load may be 4000 lbs. of high finish strip metal in a corrugated carton, steel strapped to a couple of runners, a wooden or metal container so constructed that it can be picked up and moved by a variety of equipment. Or it may be any one of dozens of types of palletized unit loads combining approximately 20 to 100 smaller units into one mass for handling.

Let us just consider the results of the transformation of the unit load of metal strip. Today usually 400 to 500 lbs. are boxed for which the consumer pays 25 cents per 100 lbs. It costs the manufacturer of the metal more than that if he can obtain the boxes or the lumber. Why not give consideration to a pack of no greater cost for ten times the amount of material, in this instance for customers making quantity purchases? If they are not already equipped to handle these units they soon will be in some manner. In many instances, that larger economical unit can be broken down into smaller units to meet situations in the customer's plant. If we work on the basis that the new pack must not cost any more than the former pack, and in most instances it should cost considerably less, then all handling economies are bona fide savings.

All containers have their place. What really is needed is a consideration of the handling techniques. storage and shipping practices in determining the most suitable container. This simply means a realignment of containers used for certain jobs. An example of a misuse of corrugated cartons exists when bulk material placed within settles, placing the entire load of whatever is placed upon it on the side walls of the carton. Naturally, economis must rule, taking all factors into consideration. As is usually found, the manufacturer or the industry which is progressive in meeting current needs usually gets its share.

### **Growing Rapidly**

Just recently three of the larget automobile manufacturers have in structed practically all of their suppliers to make shipments in palletized unit loads, or unit loads, de pending on the product. This means that all of their assembly plants will be receiving unit loads deliered direct to assembly lines. Some will be tiers of tray separates strapped to pallets. Unit loads reduce packing costs and revolt tionize a large percentage of packaging requirements. The ve fact that these extensive progra are underway before favorable n

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Typical changeover of packing methods in the intomotive industry. Old practice at back.

mendous diversity of materials usually leads the way in adopting new techniques, it is not alone in progressing in this field today. The paper industry, which was one of the first to make shipments on skids, is making plans to modernize its methods by shipping on pallets. This is being instituted at the request of the nation's largest consumers of paper for printing.

The canners, particularly on the West Coast, are continuing to make shipments of palletized unit loads largely over the highway, a practice started during the war. Large numbers of practically every conceivable industry are unit loading for their own handling and including in their plans the use of unit loads to distribution points and large customers. These plans are being given priority of consideration in the design and layout of both new and altered plants.

### Obstacles to Overcome

The main deterent to greater progress in unit load transportation is the unwillingness of the Association of American Railroads and the I. C. C. to treat pallets as dunnage instead of containers, which they are not. The pallets should be subject to the free dunnage allowance, and then take a special tariff rather than that of the commodity which they bear. The return of pallets should also be covered by a special

The railroads admit the reductions in damage claims, faster loading and unloading, the economies of handling and storing their own supplies, particularly those roads that have cooperated with special rates within a particular state. They are, however, afraid the swing to pallets will be so rapid and so great their earned income will be seriously affected if rates are reduced. All bold steps taken by this country in the past have not worked out that way. I, for one, have enough confidence in the ingenuity of American industries to make just as

large profits by greater volume even with the squeeze between cost and

selling price.

Many railroad executives have stated that they will be ready to handle LCL freight in unit loads when the demand arises. All we require is a fair rate so that the growth of carload movements will not be impeded; then LCL movements in unit loads will come along in due time virtually of their own volition. Many railroads have spent huge sums of money in equipping permanent dunnage cars for specific uses by their shippers, but this

### Notes on Pier Design JOHN H. BERNHARD

Consultant, Waterways and Harbors, New Orleans, La.

Much of the recent development in transportation has greatly affected pier-design. There are no piers in existence today that can serve as an example of what modern piers should. Some terminal piers have ac-tually been obsolete the day they were completed, due to lack of thoroughness and foresightedness in studying relationship of cargo handling to the prompt despatch of ships.

Too substantial a superstructure must be avoided, but foundation strength must permit loads beyond the original concept of the pier's function. Structural design is important from an operating standpoint only, in-sofar as it affects the terminal usefulness, security, efficiency, cost of operating and maintenance. The prime function of a ter-minal is the maintenance of economy and speed in cargo handling.

In designing new piers we should be cognizant of the fundamental revolution that has already manifested itself in cargo handling, especially those changes caused by the development of the motor truck carriers.

With fork-trucks and pallets, mechanical truck loaders and unloaders, most of the trucks can be kept from the pier. This will call for a pallet and container exchange, with the storage and repair facilities necessary to such equipment.

This further requires that the small truck loads be unloaded at short frontal aprons, assorted, and moved by pallet trailers and fork-trucks to the locations designated.

In this manner cargoes may be assembled while avoiding confusion, loading may be expedited, and attempts frustrated to use pier floors as warehouse space.

In designing the new pier, constant thought should be given to the fact that the largest factor in the cost of transportation is not the capital servicing of pier costs but more obviously those of cargo handling.

Money expended on handling material cannot be salvaged; but spent on equipment, it has been converted from expense to capital investment, making it possible to earn a return on this invested capital, and leaving

return on this invested capital, and leaving eventually a salvage value.

Economy is obtained when the cost of equipment and methods less maintenance charges is exceeded by the savings effected. Maximum economy is obtained in handling materials by reducing the time of materialshandling to the minimum.

Handling costs are reduced greatly as cubic space is utilized. This all requires tiering and in consequence the use of lift-trucks and pallets. Placed on pallets, most general merchandise can be double-tiered, and some even stowed four-high; the effect is a manifold increase in square-foot area.

Truck operation must come under the control of the port. The more the movement of trucks in and around the piers, and ultimately within the entire port district, comes under the general control of the port, the less expensive the new piers need be, but above all the more effective they will be. The port must secure also control over the loading and unloading of trucks, and over the spotting of cargo. While this must be done by private enterprise in free competition or by contract, it should nevertheless be

brought under the general control of the port. The port should encourage the trucking companies to organize solid loads, coming and

going from the pier.

The foregoing facts may direct the designers of the new piers toward creating a modern pier, and give substantial guidance in additional port planning.

### IT RUNS INTO MONEY

THE operator of this industrial truck gets rid of a lot of money every day at the United States Bureau of



Engraving in Washington. This one load consists of \$708,000 in one dollar bills, printed 12 to a sheet. The fortune is being moved from the examining room to the cutters .- Courtesy, Electric Industrial Truck Association.

has probably been confined to certain big companies under pressure of competition. The highway truckers are cooperating in unit load movements and will offer plenty of competition.

One railroad executive writes "Will the railroads be able to use pallets in less than carload business? And when? By using unit loads we can reduce our claim payments but we all must make this

step at one time."

Necessity has often proved to be the mother of invention. Instead of waiting for the railroads to act favorably, why not ship products on a light weight, low cost pallet that may be classed as expendable. Or, use a slightly heavier pallet, yet economical in cost where product weight, dimensions, weight distribution or necessary storage prior to shipment requires such a pallet, in which case the pallet may be used for more than one trip.

### **Building Loads, Savings**

Today we know of about five general types of unit loads:

1. A box or protected piece of equipment mounted on runners.

2. Steel strapped unit loads, the next most common, which may involve a number of framed separators to keep parts in place, or simply the securing of a number of containers or flat material to the pallet.

3. Glued unit loads which can only be applied to certain types of containers, such as some cartoned goods, wood boxes and some bagged goods. Considerable progress is being made along these lines.

4. Loose palletized loads confined to containers containing products such as canned goods that permit overhang on pallets to help obtain tight stowage without breakage. Care must be exercised to obtain good results. Twine around top layer serves as a very good binder.

5. Box pallets made by stapling narrow cored flaps of collapsible corrugated tube to the pallet and strapping corrugated cap to both tube and pallet. An innumerable number of small odd shaped packages can be placed in the box pallet. Particularly adaptable for consolidated cars.

It will pay dividends to devote considerable time to working up the design of strapped unit loads with separators or tray separators, as usually this type affords the greatest economies. The automotive and electrical industries are deeply involved in working out these details. During the war some outstanding packing economies were effected in this manner. (Table 1)

Table 1—Packing Economies

Number of pitches to a load Number of loads per 100 vehicles Gross weight per load Board feet of lumber per unit Weight of lumber per unit Total board feet of lumber used, 100 vehicles Total weight of lumber used, 100 vehicles

Unit Old Method Load Method 60 90 207 Unit Loads 311 boxes 1800 lbs. 1407 lbs. 75 6 220 lbs. 20 lbs. 23,325 1242 68,420 lbs. 4140 lbs.

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tops and bottoms if possible. End cleats to facilitate handling and add

strength and diagonals to provide

additional strength where neces-

sary. The latter point particularly

applies to crates. If possible, boxes

and crates weighing over 150 lbs.

should be provided with runners to

permit entry of forks or slings.

Savings per month of both material and labor amounted to \$16,250 with 312 less loads to be handled. Similar savings but not so spectacular were obtained with sprockets and hubs.

During the prewar period this unit load produced total savings of \$277,000 the first year even though the pallets had to be returned 900



Shows how stability of load is obtained with these wheel hubs.

miles. The cost of the pallets was calculated on a basis of ten round trips, and practically all of the original lot made many more trips than that. (Photographs and complete details are recorded in the December issue of FLOW).

### Package for Mechanical Handling

Here are some of the considerations appreciated by those involved with handling and storage.

1. Walls of corrugated and fibre cartons should be sufficiently strong for stacking on pallets and tiering if they must carry the entire load. Inserts should be provided if possible to share the load. Fibre drums usually prove more satisfactory for small quantities of bulk materials.

2. Wooden boxes should have flat

3. Use nesting cans whenever they are to serve as the exterior container in transit, if at all possible.

4. Larger and heavier drums should have corrugations on the bilge or provided with beads so that the drums may be placed on pallets



A unit load of transformers used in the electrical industry.

or lifted by means of a fork truck.

5. Use bags of sufficient strength never over 100 lbs. and preferably limited to 50 lbs. Bags should be well filled and sealed so that they make even stacking possible.

 Baskets, such as fruit baskets, should not have handles projecting above the covers, preventing stacking and satisfactory distribution of loads when stacked on pallets and tiered.

 Bales should be well secured and be provided with at least two opposite flat parallel sides.

Let us all strive to plug up the big profit leaks and thereby continue to raise the high standards American living.

FLOW

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> 151-Wire Tying Machines . . . An eight-page illustrated booklet issued by the Gerrard Co., Inc. and entitled "Gerrard Blue Book of Packaging". Complete data, and applications of six different models of wire tying machines are given. Elimination of freight breakage and damage loss through uni-lastic stowage is discussed. More than

50 action photos are included.

152—Vibratory Feeders... A four-page folder discussing seven sizes of ribratory feeders manufactured by the Syntron Co., including uses, mountings, dimensions and capacities. The infor-mation also covers operational details on the feeders, control of the speed of flow, and the mechanical parts of the equipment. equipment.

153-Pneumatic Conveyors . . . An illustrated booklet (22 pages) on pneumatic conveyors, issued by the Brady Conveyors Corporation. Individual sections of the publication are devoted to suction systems, boat unloaders, coal unloaders, chemical unloaders and pressure systems. Information is given about combination suction and pressure systems, pneumatic legs and dust col-lectors, portable conveyors, and pres-sure systems for grain.

154-Portable Hydraulic Lifts . . . This presentation by the Montour Manufacturing Co. describes the "Rol-



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

a-lift", a new device for handling bulky units weighing up to 6000 lbs. Design, construction and specification data are given. Photos show typical uses of the equipment, including an application by a manufacturer of butter churns.

155—Spot Conveying . . . A presentation of the Island Equipment Corp., entitled "Busy Man's Index to Economical and Efficient Conveying Bulletin". Containing 20 illustrated pages, it covers all types of spot conveying equipment manufactured by the company.

156—Conveyor Belts . . . A broad-side on its "Griptop" conveyor belt, illustrating many applications in special illustrating many applications in special conveying problems, has been published by the B. F. Goodrich Co. The release shows how the belts, with more than 1000 rubber fingers covering every square foot of the carrying surface, speedily move ice, coal, freight and packaged goods up steep inclines.

157—Double Enveloping Gearing . . . An eight-page booklet entitled "Cone-Drive Gearing at Work in Materials Handling", offered by the Michigan Tool Co. Action photographs and explanatory diagrammatic sketches illustrate the variety of equipment for material handling in which the gearing is now being used. Practical engineer-ing data are included. (Continued)

### WHY ENGINEERED DESIGN PALLETS?

N the average fork-truck pallet installation the capital investment in pallets is greater than in the mechanical equipment. You demand ENGINEERED DESIGN in your industrial trucks to augrantee that you are receiving the most modern equipment adapted to your particular requirements and which will result not only in a reasonable first-cost but a low maintenance charge. It is only practical to demand as much from your pallet equipment.

Pallets Inc. Manufacturers of ENGINEERED DESIGN Pallets

GLEN FALLS, NEW YORK Telephone 2-2892

### **SPEEDWAYS** MOVEIT Better, Faster, Cheaper

Speedways—the all-purpose, light-weight gravity case conveyors—are the cheapest, shortest, fastest distance between two points!

Speedways new illustrated booklet shows you how —and why. Write for this picture-proof of timesaving, money-saving, manpower-saving Speedways Conveyors!

IMMEDIATE DELIVERY

Speedways Con-veyors are stocked by agents in prin-cipal cities of U. S. and Cana-

Compact, low cost Speedways are constructed of all-welded



steel channels and ball-bear-ing wheels.

STANDARD MODELS—12", 15" or 18" Widths. 5' & 10' Straight Sections. 6 or 8 or 10 Wheels Per Foot. 45° & 90" Reversible Curves. 3 Sizes Adjustable Stands. SPECIAL MODELS— 4¼" to 24" Widths. As many as 24 Wheels Per Foot. 15°, 30°, 60° or 75° reversible curves.



Buffalo 13, N. Y.

# **OPPORTUNITIES**

Men wanted

Jobs wanted

Lines available

RATES: minimum, 25 words, \$2.00; each additional word, 10c. Bold type or all capitals: minimum, 25 words, \$3.00, additional words, 15c. All insertions are payable in advance.

### LINES WANTED

Manufacturer:

We are interested in distributing pallet lift trucks. Have many inquiries for these from our thousands of customers, thruout Northern California.

ALAMEDA DISTRIBUTORS, 1926 Everett St., Alameda, Calif.

Firm of sales engineers specializing in materials handling equipment for the past twenty years are desirous of adding one or two items to their line. Box 4546, FLOW.

### JOBS WANTED

Mechanical Engineer, 7 years' experience in all phases of material handling for the industrial or food plant, foundry or warehouse, desires position as plant material handling engineer, in New York City area. Age 33. Box 4646, FLOW.

Industrial Engineer, has extensive material handling experience in food and drug field, wishes connection with plant in midwest. Age 38, excellent refer-ences. Box 4647, FLOW.



# **Controlled Production**

# on material handling problems

are the starting point for accurate production control as machines begin producing for pent-up civilian needs. They register number of pieces or parts . . . revolutions . . . lineal feet . . . they count bottles, cases, cans, cartons . . . they're accurate, rugged . . . available in many types, sizes and speeds. There's a unit for practically every industrial need.

Send now for Reference Bulletin No. 100
— in concise form it describes and illustrates 100 standard counters.

### DURANT MFG. COMPANY

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## TOWSLEY



### SPECIAL TRUCKS

engineered and produced to customers' individual requirements, are effecting appreciable savings over trucks commonly used. . . Perhaps special trucks, designed by us for you, can cut your materials handling costs.

Why not put it up to Towsley?

TOWSLEY TRUCKS, INC.

1770 Elmore St. Cincinnati 25, O.

158—Multiple-Circuit Battery Chargers . . . A six-page presentation by the Electric Products Co. about two and four-circuit battery chargers. Accessories for the equipment, capacity and power supply are discussed. A section is devoted to maintenance, operating costs, efficiency, special designs, etc.

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159—Car Shakeouts . . . An eightpage illustrated folder released by Robins Conveyors, Inc. It describes a new method of unloading hopper-bottom railroad cars. Presented are actual cases in which cars have been unloaded in 1½ to 7 minutes by only two men. Some typical application arrangements are shown. Other Robins material handling equipment is also covered.

160—Loading and Unloading Systems... "Moving Materials from Here to There" is the title of a 24-page booklet on case histories and widely divergent problems solved by the Orton Crane & Shovel Co. The publication is fully illustrated with two-color layouts. According to the company, it was written with the objective of supplying men in the field with an "idea book which suggests possible solutions to their own problems."

161—Belt Conveyors . . . Speedways Conveyors, Inc., announces its new SpeedLift Belt conveyor in a two-page bulletin. The descriptive data also cover all accessories: power driven tail feeder, the gravity head delivery unit, floor lock, hydraulic jack used to adjust the conveyor to any height and angle from a horizontal position to 35 degrees.

A bulletin issued by M. E. Cunningham Co., illustrating and describing the "Safety" wedge grip letter and figure stamps. Details are given on multiple character stamps for straight line, curved line, concave and convex marking, and interchangeable steel type holders for use where fast changing of characters is required.

163—Metal Framing . . . Unistrate Service Co. offers a four-page folder about all-purpose metal framing. Applications in cable and pipe supports, bar steel storage, merchandise storage, stationary or rolling tables, etc., are illustrated. The folder shows how any type of framing structure can be built from the company's product by using a wrench and hacksaw.

bulletin showing a new way to handle the tote boxes used by machine shops, assembly rooms, plating departments, manufacturers, printers and lithographers. This presentation by C. R. Gruber & Associates is entitled "Totem". The equipment moves up to six boxes at a time. The bulletin illustrates how loads are carried or released by dropping and lifting the handle of the "Totem".

165—Portable Gravity Conveyon are described in a four-page folder issued by the Rapids-Standard Co. Inc. Curved sections, couplers, stands, and wheels are discussed and illustrated Among the features highlighted artight-weight construction, strength, and ease in setting up and adjusting.

SAVE PRODUCTION TIME

SHOPLIFTER

One man can handle heavy dies up to 500 pounds alone. Easily moved about. Also handy for loading and unloading trucks and miscellaneous lifting jobs. Platform 24 in. x 24 in. Lift of platform 4 ft. 6 in. Price \$147.50 (foot operated floor lock optional, \$10.00 extra). Heavier capacities available up to 5000 pounds.

PROMPT DELIVERY

Full freight allowed.

2677 West Van Buren Street Chicago 12, Illinois



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ON THE PALLET . . .

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sary, which is undesirable because of lumber shortage. These specifications also include export specifications. FLOW will be glad to send any requests for this manual to the Association.

THE structural clay products industry is among the newest to receive a tremendous stimulus toward mechanization; until today the manufacture of brick and tile has been primarily a hand process. Their productivity was low and, since the elapsed time between cutting machine and stock pile often averaged well over a month, the spread in labor costs and delivery made the cost of this manufacturing process out of line with modern distribution of similar products.

With the introduction of tunnel kilns (now combined with a drier) there has been an approach to a continuous assembly line method of production and handling has been reduced considerably. Forker lift trucks have been developed to handle brick or tile of any size. Other types of handling equipment, such as overhead cranes, have been devised for setting brick and unloading scove kilns. Brick "grabs" load and unload a kiln car at a time.

Mechanical conveyor belts are used to carry raw materials to the grinding and processing machines, as well as to remove the green ware from the cutting machines and to the driers. Automatic conveyors and lifts are also used to carry the brick to the kiln for setting.



NO HELPERS NEEDED.

EXCLUSIVE THIRD-WHEEL FEATURE in foot pedal insures dependable load support and bal-ance—plus safety—and enables loaded truck to stand alone.

Write for free Bulletin 45. THE SABIN MACHINE CO. CLEVELAND 3. OHIO



ALSO TOTE PAN, BOX, CARBOY, KEG TRUCKS!



RVICE CASTER & TRUCK DIVISION

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REPRESENTATIVES IN ALL PRINCIPAL CITIES

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Executive Offices: 231 South LaSalle Street, Chicago 4, Illinois

### Barrel Truck Loads Automatically

Barrels weighing up to 1,000 lbs. can be handled with ease . . . Truck weighs only 85 lbs.

To load, you simply shove truck up against barrel or drum, then drop the sliding steel "catch" down over the rim . . . pull truck handles toward you and it will load automatically without rocking or tugging. Loads from a row as easily as when barrel stands alone.

Two 10°, roller bearing wheels. Greatest width at any point is only 22°, thus permitting it to pass through aisles and doors too narrow for many trucks. All welded. Finished in air dry enamel.



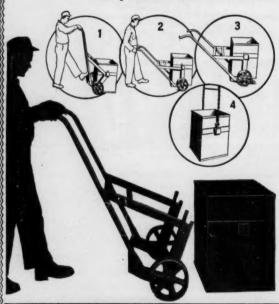


# Multi-Purpose Cart

The ideal cart for moving and dumping ashes, scrap, small parts, mind concrete, liquids, fertilizer or other materials. Sturdily constructed to handle heaviest loads and stand up under roughest usage. Design and balance result in easy wheeling and convenient dumping.

Heavy steel body with reinforcing flange all around the top edge. Inside measurements of body: 45" long at top, 32" long at bottom, 24" wide and 17" deep. Overall measurements: 79" long, 30" high, 30" wide. Two 24" by 2" steel spoke wheels. Sturdy tubular handles extend 34" out from body of cart. Legs are angle iron. All welded construction. Finished in air dry enamel. Weight approximately 130 lbs.

### Square Trunnion Box and Trunnion Box Truck



Used for transporting work in process between operations or for hauling stock to storage; will handle all types of material including hot parts or liquids. Square.shaped boxes stack easier and save considerable floor space when compared with the commonly used round box. One truck serve any number of boxes.

Boxes are made of 12-gauge steel plate, with steel plate reinforcing at tranion. All welded construction and water tight. Measure 18" by 18" by 24" high. Top edge formed for reinforcement. Weight 80 lbs.

Trunnion box truck is built of heavy bar stock, well reinforced, tubular handles, welded construction. Two 10" x 2 ½" roller bearing, metal wheels. Weight 100 lbs. Box and truck air dry enamel finish.

Operator moves trunnion truck to where forked uprights engage has trunnions, then a slight push down on truck handles picks box 3" off flow for easy wheeling. May also be used with overhead hoist.

Trunnion Box Truck-Item B-268...... \$3750 each

### Barrel and Box Skid-All Steel

All steel—welded construction—sturdily built—light weight—easy to handle.

Skid measures 14" wide overall. Will stand up under the heaviest barrel or box. Finished in air dry enamel.

Item B-470-8......\$2200 Item B-470-10.....\$2750 is 8 ft. long, weighs 45 lbs. is 10 ft. long, weighs 50 lbs.

is 0 it. long, weighs 45 lbs.

If longer skids are desired, specify length and add \$2.75 to each foot length over the 10 ft. length and price here quoted.

When Ordering always give "Item" number this will help prevent error. All prices are fab Detroit.

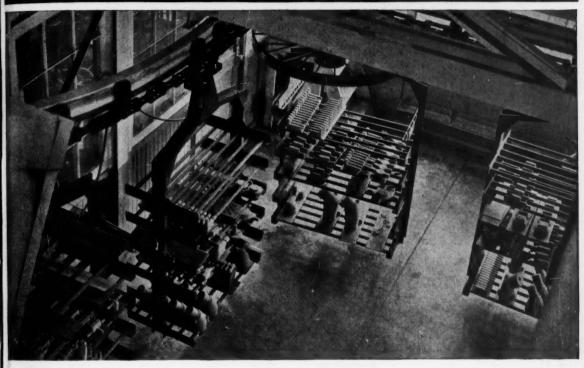
Designers and Builders of all types of Trucks, Sirids, Pallets, Platforms, Racks, Boxes, Bin, Tables, for Pick-up, Loading, Moving, Shippiss Dumping and Storage.

Palmer Skile (

# Mathews

### TROLLEY CONVEYERS

Engineered to serve Production



Trolley Conveyers are being applied in modern foundries for handling materials, usually cores and castings, through Production Departments, from one building to another, and in many other ways are operating to serve production. Transverse bends lower the loads to working height, keeping a continuous flow of materials reaching the working area. The conveyers do their work without occupying valuable floor and aisle space. They can serve one or several floor levels, and can be applied inside or outside the buildings. Variable speed drives make possible the exact control of the material reaching the working areas and the many types of hangers available add to the flexibility of the conveyers. Mathews Trolley Conveyers, like other prominent Mathews types for foundry application, are on the job today in many of the nation's great foundries. A Mathews Engineer operates in your vicinity, and would appreciate an opportunity to help you with that conveying problem.



Mathews Conveyer Company

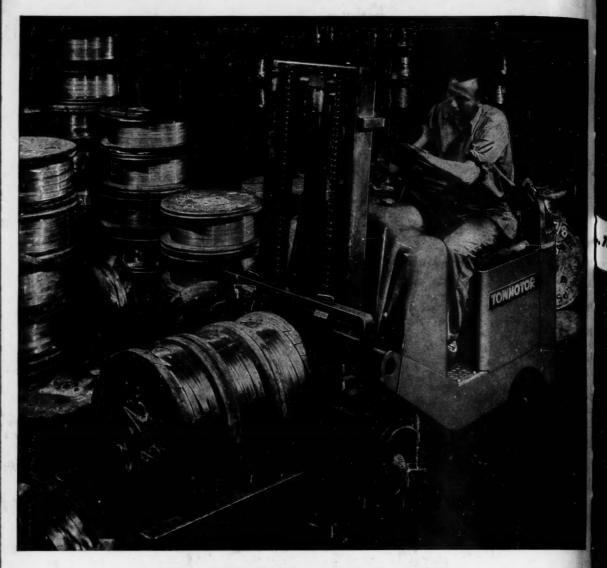


types of oxes, Bina, Shippins

85 each

50 each

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### AN OUNCE OR A TON

THE manufacture of electrical equipment, involving the use of thousands upon thousands of parts ranging from tiny nuts and bolts to heavy castings and large reels of wire and strap copper, creates an unusually varied handling problem. To one prominent manufacturer, faced with increased production schedules, this problem was complicated still more because production operations had to be carried on in and between several connected buildings.

Analysis of the problem revealed the need of a handling system capable of transporting materials and partially-finished products of varying sizes, shapes

and weights between production operations. Towmotor, the modern materials handling system. was chosen because of its ability to operate with heavy loads under low ceilings, to carry loads up steep inclines and through narrow aisle-ways. Particularly important was its flexibility which permitted switching quickly from one task to another. It could and does work regularly in receiving, stores, machine shops, heavy assembly and shipping. Now, without having had to rearrange machinery, production has been increased, man hour handling costs have been reduced and personnel safety has been measurably improved.

For every handling problem there is an engineered solution ... a solution based upon Towmotor experience and know-how gained in solving handling problems in every industry. Send for your copy of the Towmotor Lift Truck ANALYSIS GUIDE today. Towmotor Corporation, Div. 12, 1226 East 152nd Street, Cleveland 10, Ohio.

TOWMOTOR

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